



eCOMMONS

Loyola University Chicago  
Loyola eCommons

---

Master's Theses

Theses and Dissertations

---

1971

## A Brief Study Regarding G. W. Leibniz's Conceptions of Time

Loo Ina Van

*Loyola University Chicago*

Follow this and additional works at: [https://ecommons.luc.edu/luc\\_theses](https://ecommons.luc.edu/luc_theses)



Part of the [Philosophy Commons](#)

---

### Recommended Citation

Van, Loo Ina, "A Brief Study Regarding G. W. Leibniz's Conceptions of Time" (1971). *Master's Theses*. 2608.

[https://ecommons.luc.edu/luc\\_theses/2608](https://ecommons.luc.edu/luc_theses/2608)

This Thesis is brought to you for free and open access by the Theses and Dissertations at Loyola eCommons. It has been accepted for inclusion in Master's Theses by an authorized administrator of Loyola eCommons. For more information, please contact [ecommons@luc.edu](mailto:ecommons@luc.edu).



This work is licensed under a [Creative Commons Attribution-Noncommercial-No Derivative Works 3.0 License](#).  
Copyright © 1971 Loo Ina Van

A BRIEF STUDY REGARDING G. W. LEIBNIZ'S  
CONCEPTIONS OF TIME

by

Ina Van Loo

A thesis submitted to the Graduate School of  
Loyola University of Chicago in partial  
fulfillment of the requirements for  
the degree of Master of Arts.

June

1971

## PREFACE

The primary purpose of this thesis is to present G. W. Leibniz's conceptions of time, namely the Platonic and the relational. In this thesis, the interpretation of the Platonic conception is limited to the extent that it is developed in terms of Leibniz's own system. This is to say that the conception is not developed in terms of its relatedness to Plato's Timaeus. In regard to the relational conception, the path followed was that of confronting Isaac Newton instead of Samuel Clark. If the path followed had been that of confronting Clark, it seems that another interpretation, involving the problem of God to a greater extent, might have been worked out.

The translations used within the body of this paper are those of Philip Wiener in his Leibniz Selections, except for the Leibniz-Clark Correspondence where the translation of H. G. Alexander was used and for the New Essays Concerning Human Understanding where the translation of Alfred Langley was used.

## TABLE OF CONTENTS

INTRODUCTION. . . . .	1
CHAPTER ONE: . . . . .	4
Time viewed as the receptivity or capacity of the world, that is, the ground upon which the world is to be built.	
CHAPTER TWO: . . . . .	11
Time viewed as relational, with consideration of 1). Newton (who holds an absolute view of time) ii). Newton and Leibniz, in comparison.	
CHAPTER THREE: . . . . .	36
Time as an idealization of the existing relations between things.	
CHAPTER FOUR: . . . . .	68
Concerning the question as to what moment of time the world was created.	
BIBLIOGRAPHY: . . . . .	80

## INTRODUCTION

This paper is a study of Gottfried Wilhelm Freiherr von Leibniz's conceptions of time. It is the writer's view, and subsequently the view of this paper, that Leibniz holds two quite different conceptions. The first may be named his Platonic conception, whereas the second may be named his relational conception.

Leibniz's Platonic conception of time is considered in chapter one. The conception itself is expressed briefly by Leibniz in his essay De rerum originatione radicali dated November 23, 1697. Within the essay, time and place are viewed as the receptivity or the capacity of the world, that is, the ground upon which the world can be most easily built. This essay, according to Paul Schrecker in his paper "Leibniz and the Timaeus" which appeared in the Review of Metaphysics, VI, June, 1951, shows Leibniz's Platonic inspiration. Thus the view of time considered within chapter one is termed the Platonic conception, although it does not receive analysis as it stands related to Plato's view of time in the Timaeus. Rather, it is presented in terms of Leibniz's system. The relationship of God and the possible worlds within His ideas, one of which he actualizes (the best possible world) in view of the principles of continuity and identity of indiscernibles, is discussed.

The relational conception of time is the conception that

Leibniz is most known for. Its expression is found mainly in the Leibniz-Clark Correspondence. Isaac Newton, as well as Samuel Clark are holders of the absolute conception of time. It is true that Samuel Clark is Newton's spokesman and defender in the Leibniz-Clark Correspondence. Yet, it seems possible to maintain that Clark presents his own view of time in addition to defending that of Newton. In chapter two of this paper, which chapter considers the differentiation between the absolute view of time and the relational view of time, Leibniz's relational view of time is presented as it stands related to Isaac Newton's absolute view of time. Given this, the Philosophiae Naturalis Principia Mathematica has been used as the source of Newton's view of time, instead of the Leibniz-Clark Correspondence.

To present the relational view of time, a discussion of the Leibnizian monads and "phenomena" is necessitated. Time is shown in chapter two to be an ideal thing, given the factor of the monads not being in time. Time is, accordingly, an idealization of the existing relations among "phenomena." In relationship to the absolute view, it is concluded that Leibniz holds a view of time which is a relative, sensible, apparent measure.

Chapter three of this paper grows out of consideration of the points of comparison (listed in chapter two, subsection ii) between the relational view and the absolute view of time. The focus of the chapter is on the relational view again, but in the sense of developing with greater depth the meaning of the relational conception. To do this, reliance has been

made upon Leibniz's New Essays Concerning Human Understanding, especially with regard to the problems of duration, infinity and eternity. Here an attempt is made to grasp further the meaning of time as an idealization of the relations among things actually existing.

Again involving the relational conception of time, chapter four considers the question as to why it is not meaningful, on Leibniz's view, to raise the question as to what moment of time the world was created. The question itself occupies an important place in the Leibniz-Clark Correspondence.



## CHAPTER ONE

### TIME VIEWED AS THE RECEPTIVITY OR CAPACITY OF THE WORLD

The task of this chapter is to consider Leibniz's Platonic conception of time. Within this chapter, the conception is developed in terms of Leibniz's metaphysical system. The approach is one of discussing first, the relationship of God and the possible worlds within His ideas and second, time as the receptivity or capacity of the world. This being said, let us now turn to a consideration of the relationship of God and the possible worlds within His ideas.

God is the center of Leibniz's metaphysical system. As the first substance, His existence follows upon His essence. The existence of the other substances depends upon Him. Let us therefore examine the nature of this dependency.

Prior to creation of this actual world, there were an infinity of possible worlds<sup>1</sup> existing in the mind of God. God "contemplates" all the possible worlds (or series of possible things) and after contemplating, selects one for actualization.

---

<sup>1</sup>"...Aliquam in rebus possibilibus, seu in ipsa possibilitate vel essentia esse exigentiam existentiae, vel (ut sic dicam) praetensionem ad existendum et, ut verbo complectar, essentiam per se tendere ad existentiam. Unde porro sequitur, omnia possible, seu essentiam vel realitatem possibilem exprimentia, pari jure ad essentiam tendere pro quantitate essentiae seu realitatis, vel pro gradu perfectionis quem involvunt; est enim perfectio nihil aliud quam essentiae quantitas." C. I. Gerhardt, ed., Die philosophischen Schriften von Gottfried Wilhelm Leibniz, Vol. VII (Berlin, 1890), p. 303.

As Leibniz states:

...There is in possible things, that is, in the very possibility or essence, a certain exigent need of existence, and, so to speak, some claim to existence; in a word, that essence tends of itself towards existence. Whence it further follows that all possible things, whether expressing essence or possible reality, tend by equal right toward existence, according to their quantity of essence or reality, or according to the degree of perfection which they contain, for perfection is nothing else than quantity of essence.<sup>2</sup>

And "...among the infinite combinations of possibles and possible series, that one actually exists by which the most of essence or of possibility is brought into existence."<sup>3</sup>

Out of the infinite possible worlds, there is, in fact, a best possible world. "...If there were no best possible series, God would certainly have created nothing, since he cannot act without reason,<sup>4</sup> or prefer the less perfect to

---

<sup>2</sup>"Ut autem paulo distinctius explicemus, quomodo ex veritatibus aeternis sivi essentialibus vel metaphysicis oriantur veritates temporales, contingentes sive physicae, primum agnoscere debemus eo ipso, quod aliquid potius existit quam nihil, aliquam in rebus possibilibus seu in ipsa possibilitate vel essentia esse exigentiam existentiae, vel (ut sic dicam) praetensionem ad existendum et, ut verbo complectar, essentiam per se tendere ad existentiam. Unde porro sequitur, omnia possible, seu essentiam vel realitatem possibilem exprimentia, pari jure ad essentiam tendere pro quantitate essentiae seu realitatis, vel pro gradu perfectionis quam involvunt; est enim perfectio nihil aliud quam essentiae quantitas." Ibid.

<sup>3</sup>"Hinc vero manifestissime intelligitur ex infinitis possibilium combinationibus seriebusque possibilibus existere eam, per quam plurimum essentiae seu possibilitatis perducitur ad existendum." Ibid.

<sup>4</sup>Cf. Ibid., VII, p. 393. Therein Leibniz states: "19. Et la perfection de Dieu demande que toutes ses actions soient conformes à sa sagesse, et qu'on ne puisse point luy reprocher d'avoir agi sans raison, ou même d'avoir preferé une raison plus foible à une raison plus forte."

Number nineteen refers to the paragraph number in the Leibniz-Clark Correspondence.

the more perfect...."<sup>5</sup>

Given this, what are the criteria of perfection which suggest to God, that there is a best possible world?

...Perfection is to be placed in form [i.e., as the context shows, in quantity of forms], or variety; whence it follows that matter is not everywhere uniform, but is diversified by assuming different forms; otherwise, as much variety as possible would not be realized....It follows likewise that that series prevails through which there can arise the greatest possibility of thinking of things as distinct (distincta cogitabilitas)...The actual universe is the collection<sup>6</sup> of the possibles which forms the richest composite.

God actualizes the maximum number of things, through utilization of the simplest laws, which laws number two:

(1) Principle of Continuity.

...There is a perfect continuity reigning in the order of successive things, so there is a similar order in simultaneous things, which fact establishes the plenum as real, and consigns empty spaces to imaginary realms. In things existing simultaneously there may be continuity even though the imagination perceives only breaks; because many things appear to our eyes to be completely dissimilar and disunited which nevertheless turn out to be perfectly similar and unified,<sup>7</sup> internally if we could get to know them distinctly.

---

<sup>5</sup>"Meo iudicio, nisi daretur series optima, nihil plane crearet Deus quia non potest agere praeter rationem, quod praeferre minus perfectum alteri perfectioni." Ibid., II, pp. 424-25.

<sup>6</sup>"(11) Existit ergo perfectissimum, cum nihil aliud sit quam quantitas realitatis. (12) Porro perfectio non in sola materia collocanda est, seu in replente tempus et spatium, cujus quocumque modo eadem fuisset quantitas, sed in forma seu varietate. (13) Unde jam consequitur materiam non ubique sibi similem esse, sed per formas reddi dissimilarem, alioqui non tantum obtineretur varietatis quantum posset. Ut taceam quod alibi demonstravi, nulla alioque diversa phaenomena esse extitura. (14) Sequitur etiam eam praevaluisse seriem, per quam plurimum oriretur distinctae cogitabilitatis." Ibid., VII, p. 290.

<sup>7</sup>A. Buchenau and Ernst Cassirer, ed., G. W. Leibniz Philosophisches Werke, Vol. II (Leipzig, 1924) pp. 556-59 quoted in Philip Wiener, ed., Leibniz Selections (New York: Charles Scribner's Sons, 1951) p. 186.

(2) The Identity of Indiscernibles.

...There are not in nature two real, absolute beings, indiscernible from each other; because if there were, God and nature would act without reason, in ordering the one otherwise than the other; and...therefore God does not produce two pieces of matter perfectly equal and alike.<sup>8</sup>

What is it that is to be filled with the greatest amount of existence (the greatest number of possibles actualized) by use of the simplest laws? The answer is, time and place. Time and place are the receptivity or the capacity of the world, that is, the ground upon which the world can be most easily built. As Leibniz himself states:

...There is always in things a principle of determination which is based on consideration of maximum and minimum, such that the greatest effect is obtained with the least, so to speak, expenditure. And here the time, the place, or in a word, the receptivity or capacity of the world may be considered as the expenditure or the ground upon which the world can be most easily built....The matter itself may be compared to certain games where all the spaces on a table are to be filled according to determined laws, and where, unless a certain skill be employed, you will be finally excluded by unfavorable spaces and forced to leave many more places empty than you intended or wished. But there is a certain way of filling most easily the most space. Just as, therefore, if we have to make a triangle, there being no other determining reason, it will be an equilateral one; and if we have to go from one point to another, without any further determination as to the way, the easiest and shortest path will be chosen; so it being once posited that being is better than not being, or that there is a reason

---

<sup>8</sup>21. Il faut avouer que ce grand Principe, quoyqu'il ait été reconnu, n'a pas été assez employé. Et c'est en bonne partie la raison pourquoy juqu'icy la Philosophie premiere a été si peu féconde, et si peu démonstrative. J'en infere entre autres consequences, qu'il n'y a point dans la Nature deux Etres reels absolus indiscernables: parce que s'il y en avoit, Dieu et la Nature agiroient sans raison, en traitant l'un autrement que l'autre; et au ainsi Dieu ne produit point duex portions de matière parfaitement egales et semblables." Gerhardt, Philosophische Schriften, VII, p. 393.

why something rather than nothing should be, or that we must pass from the possible to the actual, it follows that, even if nothing further is determined, the quantity of existence must be as great as possible, regard being had to the capacity of the time and of the place (or to the possible order of existence), exactly as tiles are disposed in a given area in such a way that it shall contain the greatest number of them possible.<sup>9</sup>

In view of Leibniz's brief statement of time,<sup>10</sup> as that

---

<sup>9</sup>"Hinc vero manifestissime intelligitur ex infinitis possibilitum combinationibus seriebusque possibilibus existere eam, per quam plurimum essentiae seu possibilitatis perducitur ad existendum. Semper scilicet est in rebus principium determinationes quod a Maximo Minime petendum est, ut nempe maximus praestetur effectus, minimo ut sic dicam sumtu. Et hoc loco tempus, locus, aut ut verbo dicam, receptivitas vel capacitas mundi haberi potest pro sumtu sive terreno, in quo quam commodissime est aedificandum, formarum autem varietates respondent commoditati aedificii multitudinique et elegantiae camerarum. Et sese res habet ut in ludis quibusdam, cum loca omnia in Tabula sunt replenda secundum certas leges, ubi nisi artificio quodam utare, postremo spatiis exclusus iniquis, plura cogeris loca relinquere vacua, quam poteras vel volebas. Certa autem ratio est per quam repletio maxima facillime obtinetur. Uti ergo si ponamus decretum esse ut fiat triangulum, nulla licet alia accidenti determinandi ratione, consequens est, aequilaterum prodire; et posito tendendum esse a puncto ad punctum, licet nihil ultra iter determinat, via elegetur maxime facilis seu brevissima; ita posito semel ens praevalere non-enti, seu rationem esse cur aliquid potius extiterit quam nihil, sive a possibilitate transeundum esse ad actum hinc, etsi nihil ultra determinetur, consequens est, existere quantum plurimum potest pro temporis locique (seu ordinis possibilis existendi) capacitate, prorsus quemadmodum ita compenuntur tessellae ut in proposita area quam plurimae capiantur." *Ibid.*, VII, pp. 303-04.

<sup>10</sup>Cf. Paul Schrecker, "Leibniz and the Timaeus," Review of Metaphysics, IV (June, 1951), 495-505. Therein, Paul Schrecker notes the following. "Among the thousands of philosophic essays, outlines, projects, and other minor papers left by Leibniz there is one which shows with particular clarity his Platonic inspiration. This essay may even be considered, I think, as an attempt toward the actualization of his desideratum of casting into a systematic form at least one important part of the Platonic doctrine, namely, the central idea of the Timaeus, the dialogue to which Leibniz referred most frequently and most positively. And the understanding of this much quoted and much misinterpreted little work can only profit when it is regarded in its relation to the Timaeus. This opuscle, the De rerum originatione radicali, dated November 23, 1697...."

which is to be filled with the maximal series of possibilities,

(497) "Nowhere in the De rerum originatione is there any nominatim reference to Plato. One may think that Leibniz tried to support a certain Platonic doctrine by the proper weight of the argument without recourse to the authority of its author. The problem discussed is however clearly that which constitutes the most important and timeless part of the Timaeus, namely the relationship of intelligence and necessity, final and efficient causes, or, as Leibniz also defined the antagonism, architectonic and mathematical, respectively, metaphysical principles." (498-99) "Exactly like the Timaeus, the De rerum originatione starts with postulating the existence of an extramundane cause of the world of becoming to avoid the infinite regression. Since every link in the causal chain is necessary only hypothetically, an agent outside the series of causes, a being endowed with absolute, that is, metaphysical necessity is required to account for the reality of the existing world of becoming. This God, however, is not an omnipotent agent any more than the Platonic demiurge. The three independent factors of reality introduced by Plato - the eternal pattern, the receptacle, and the demiurge - are adopted by Leibniz, although divested of their mythological garb and rationalized into pure logico-metaphysical constructs." (499) "Firstly, the pattern or forms. For Leibniz, they have taken on the character of eternal or necessary truths, also called truths of reason, and elsewhere identified with essences, possibles, or real definitions." (499) "There seems to be...an important difference between Plato's pattern and Leibniz's eternal essences. The latter,...are not merely unchanging forms but dynamic agents. Every essence or possible reality, according to Leibniz, tends toward existence, and the force of this conation is proportional to the quantity of reality or perfection involved in the essence."<sup>20</sup> (500) "The second factor of reality, the Platonic Receptacle, is identified by Leibniz with time and space which together he terms the receptivitas vel capacitas mundi and which he considers as the order of possible existence. I need not elaborate on the opposition to Plato insofar as time is concerned, which may be accounted for historically by the rise of mathematical dynamics,...May it suffice to remark that Leibniz like Plato realized that the eternal essences alone cannot account for the reality of the phenomenal world of becoming. For Leibniz, however, space and time belong to the intelligible realm rather than to that apprehended by 'bastard reasoning' (52B)." (501) "The third factor is God fulfilling the function of the Platonic demiurge. But once this demiurge is entirely demythologized and the other factors rationalized, what function remains to him? The essences or possibles vie among themselves for existence - logically, of course, not in a process in time - and this process of competition leads necessarily toward the actualization of the maximum of reality or perfection. God being himself conceived as

I should like to pose the following questions, which questions unfortunately will remain unanswered:

- (1) Is time, as a receptacle, logically prior to the maximal series of possibilities actualized?
- (2) If time is logically prior to the actualization of the maximal series, does this mean that it is, somehow, temporarily prior?
- (3) What is the relationship between God and time, that is, does time have the same ontological status as God?
- (4) What is the origin of the receptacle?

---

perfect - or, in the Platonic sense, good - cannot but ratify the outcome of this rational calculus of maxima, by adding to that possible world or combination of possibles whose perfection outweighs that of the others the unintelligible quality of actuality. He is like an ideal chess player for whom the best move would have been calculated infallibly and who could not but perform it on the chess board. The rules of chess may stand,...for the eternal truths which are independent of the will of the chess player: he can only make the best use of them."(501)

## CHAPTER TWO

### TIME VIEWED AS RELATIONAL

The previous chapter considered Leibniz's Platonic conception of time. This chapter will consider Leibniz's relational conception of time. To elucidate this conception of time, three things are done in this chapter, namely:

- (1) that of attempting to present the relational view of time that is propounded by Leibniz in the Leibniz-Clark Correspondence,
- (2) that of attempting to present Isaac Newton's absolute conception of time as it is found in his Philosophiae Naturalis Principia Mathematica,
- (3) that of attempting to state points of comparison between Leibniz and Newton, with regard to their conceptions of time.

Points two and three are treated in this chapter as subsections of the chapter. This is to say that, subsection i considers Isaac Newton's absolute conception of time and subsection ii considers points of comparison between Leibniz and Newton.

Let us now turn to the task of stating the relational view of time that is propounded by Leibniz in the Leibniz-Clark Correspondence.

It is Leibniz's view that time (as well as space) is not anything absolute, that is, time is not anything beyond certain



orders of things. As Leibniz himself states, "...the hypothesis [that space and time are anything absolute]<sup>1</sup> is contradictory, that is, 'tis an impossible fiction."<sup>11</sup> To facilitate explication of Leibniz's notion of time as relational, it seems necessary to turn to a discussion concerning the single monad, with consideration of "intra-monadic time" as well as "inter-monadic time."<sup>12</sup>

The monad<sup>13</sup> is a simple substance (that is, the monad is without parts) which enters into composites. "Now where there are no parts, neither extension, nor figure, nor divisibility

---

<sup>11</sup>"...16. Mais cela n'estant point, l'hypothese est contradictoire, c'est à dire, c'est une fiction impossible." Gerhardt, Philosophische Schriften, VII, p. 374.

<sup>12</sup>Cf. Nicholas Rescher, The Philosophy of Leibniz (New Jersey: Prentice-Hall, 1967), pp. 58-65, wherein this distinction of "intra-monadic time" and "inter-monadic time" occurs.

<sup>13</sup>Cf. Gerhardt, Philosophische Schriften, VI, 609-610. Therein it is noted that: "18. On pourroit donner le nom d'Entelechies à toutes les substances simples ou Monades créées, car elles ont en elles une certaine perfection ( $\xi\chi\omicron\upsilon\epsilon\lambda\ \tau\omicron\delta\ \epsilon\gamma\tau\epsilon\lambda\epsilon\varsigma$ ), il y a une suffisance ( $\alpha\upsilon\tau\alpha\rho\kappa\epsilon\iota\alpha$ ) qui les rend sources de leur actions internes et pour ainsi dire des Automates incorporels."

<sup>14</sup>Cf. J. E. Erdmann, ed., Gottfried Wilhelm Leibniz Opera Philosophica, I (Meisenheim: Scientia Aalen, 1959), p. 126. Therein it is noted by Leibniz that: "...11. Mais les atomes de matière sont contraires à la raison: outre qu'ils sont encore composés de parties; puisque l'attachement invincible d'une partie à l'autre, (quant on le pourroit concevoir ou supposer avec raison) ne détruiroit point leur diversité. Il n'y a que les atomes de substance, c'est-à-dire, les unités réelles et absolument destituées de parties, qui soient les sources des actions, et les premiers principes absolus de la composition des choses, et comme les derniers éléments de l'analyse des substances. On les pourroit appeler points métaphysiques: ils ont quelque chose de vital et une espece de perception, et les points mathématiques sont leur point de vûe, pour exprimer l'Univers.

is possible,...these monads are the true atoms of nature, and, ...the elements of all things."<sup>15</sup> And, "...the monads can only begin or end all at once,...they can only begin by creation and end by annihilation...."<sup>16</sup>

Each monad is different from the other by the smallest amount of internal difference, that is, each monad's complete individual notion differs from any other monad by the smallest amount of internal difference.<sup>17</sup>

According to Leibniz:

7. There is...no way of explaining how a monad can be altered or changed in its inner being by any other creature, for nothing can be transposed within it, nor can there be conceived in it any internal movement which can be excited, directed, augmented or diminished within it, as can be done in composites, where there is change among the parts. The monads have no windows through which anything can enter or depart. The accidents cannot detach themselves nor go about outside of substances....Thus neither substance

---

<sup>15</sup>"3. Or là, où il n'y a point de parties, il n'y a ny étendue, ny figure, ny divisibilité possible. Et ces Monades sont les veritables Atomes de la Nature, et en un mot les Elemens des choses." Gerhardt, Philosophische Schriften, VI, p. 607.

<sup>16</sup>"6. Ainsi on peut dire, que les Monades ne sauroient commencer ny finir que tout d'un coup, c'est à dire elles ne sauroient commencer que par creation, et finir que par annihilation, au lieu, que ce qui est composé, commence ou finit par parties." Ibid.

Cf. Erdmann, I, pp. 125-26. Therein Leibniz notes that: "...7. Et puisqu'ainsi il n'y a point de première naissance ni de génération entièrement nouvelle de l'animal, il s'ensuit qu'il n'y en aura point d'extinction finale, ni de mort entière prise à la rigueur métaphysique; et que par conséquent au lieu de la transmigration des ames, il n'y a qu'une transformation d'un même animal, selon que les organes sont pliés différemment, et plus ou moins développés."

<sup>17</sup>The principle of the Identity of Indiscernibles is central to the Leibnizian metaphysics.

nor accident can enter a monad from outside.<sup>18</sup>

The monad is completely determined (that is, 'programmed') in respect to its internal constitution, as well as to the maximum of perfection that is attainable by it. Whatever happens internally to the being of the monad, in addition to the "time"<sup>19</sup> at which the change is to occur, is determined. As the individual monad unfolds (changes), it develops through "time" continuously.<sup>20</sup> In point of fact,

---

<sup>18</sup>"7. Il n'y a pas moyen aussi d'expliquer, comment une Monade puisse être altérée ou changée dans son intérieur par quelque autre creature, puisqu'on n'y sauroit rien transposer ny concevoir en elle aucun mouvement interne, qui puisse être excité, dirigé, augmenté ou diminué là dedans, comme cela se peut dans les composés, où il y a de changement entre les parties. Les Monades n'ont point de fenêtres, par lesquelles quelque chose y puisse entrer ou sortir. Les accidens ne sauroient se détacher, ny se promener hors des substances, comme faisoient autres fois les especes sensibles des Scholastiques. Ainsi ny substance ny accident peut entrer de dehors dans une Monade." Gerhardt, Philosophische Schriften, VI, pp. 607-08.

Cf. Erdmann, I, p. 127. The following is to be noted: "...13. Il est bien vrai qu'il n'y a point d'influence réelle d'une substance créée sur l'autre, en parlant selon la regueur métaphysique, et que toutes les choses, avec toutes leurs réalités, sont continuellement produites par la vertu de Dieu;..."

Cf. Ibid. The following is to be noted: "14. Etant donc obligé d'accorder qu'il n'est pas possible que l'ame ou quelque autre véritable substance puisse recevoir quelque chose par dehors, si ce n'est par la toute - puissance divine,..."

Cf. Ibid. The following should be noted also: "...14. C'est qu'il faut donc dire que Dieu a créé d'abord l'ame, ou toute autre unité réelle, en sorte que tout lui naisse de son propre fonds, par une parfaite spontanéité à l'égard d'elle-même, et pourtant avec une parfaite conformité aux choses de dehors."

<sup>19</sup>The finding of "time" at the monadic level, will be seriously brought into question, as this section progresses. Thus, quotation marks occur around the word "time." The differentiation between "intra-monadic time" and "inter-monadic time" would, therefore, fall into question. Perhaps the distinction would be better rendered thus, "intra-monadic change of state" and "inter-monadic change of state."

<sup>20</sup>Cf. Gerhardt, Philosophische Schriften, VI, p. 608.

...12. ...There must be an individuating detail of changes, which forms...the specification and variety of simple substances. This detail must involve a multitude in the unity or in that which is simple.

...13. Since every natural change takes place by degrees, something changes and something remains, there must be in the simple substance a plurality of affections and of relations, although it has no parts.<sup>21</sup>

In particular the following ought to be noted: "10. Je prends aussi pour accordé, que tout être créé est sujet au changement, et par conséquent la Monade créée aussi, et même que ce changement est continué dans chacune." and "11. Il s'ensuit de ce que nous venons de dire, que les changements naturels des Monades viennent d'un principi interne, puisqu'une cause externe ne sauroit influencer dans son interier\*)."

Cf. Ibid., VII, p. 308. There it is noted that: "In cumulum etiam pulchritudinis perfectionisque universalis operum divinorum, progressus quidam perpetuus liberrimus totius Universi est agnoscendus, ita ut ad majorem semper cultum procedat. Quemadmodum nunc magna pars terrae nostra culturam recepit et recipiet magnis magisque. Et licet verum sit, interdum quaedam rursus silvescere aut rursus destrui deprimique, hoc tamen ita accipiendum est, ut paulo ante afflictionem interpretati sumus, nempe hanc ipsam destructionem depressionemque prodesse ad consequendum aliquid majus, ita ut ipso quodammodo damno lucremur. Et quod objici posset: ita oportere ut Mundus dudum factus fuerit Paradisus, responsio praesto est: etsi multae jam substantiae ad magnam perfectionem pervenerint, ob divisibilitatem tamen continui in infinitum, semper in abyssis rerum superesse partes sopitas adhuc excitandas et ad majus meliusque et ut verbo dicam, ad meliorem cultum provehendas. Nec proinde unquam ad Terminum progressus perveniri."

<sup>21</sup>"12. Mais il faut aussi, qu'outre le principe du changement il y ait un détail de ce qui change, qui fasse pour ainsi dire la specification et la variété des substances simples. 13. Ce détail doit envelopper une multitude dans l'unité ou dans le simple. Car tout changement naturel se faisant par degrés, quelque chose change, et quelque chose reste; et par conséquent il faut que dans la substance simple il y ait une pluralité d'affections et de rapports quoyqu'il n'y en ait de parties." Ibid., VI, p. 608.

The enduring throughout "time" suggests that the monad has a past, present and future. With regard to the physical continuity in Nature, Leibniz states:

To my mind everything is interconnected in the universe by virtue of metaphysical reasons so that the present is always pregnant with the future, and no given state is explicable naturally without reference to its immediately preceding state. If this be denied, the world will have hiatuses which would upset the Principle of Sufficient Reason and will compel recourse to miracles or to pure chance in the explanation of phenomena.<sup>22</sup>

At each stage of its development, the monad perceives the other developing monads or mirrors the other monads (that is, the entire universe). The correspondence, resultant from the mutual perceptions (or the mutual mirroring), is the result of the divinely ordained pre-established harmony. "The passing state, which involves and represents a multitude in unity or in the simple substance, is...perception"<sup>23</sup> which is to be distinguished from apperception (or consciousness).<sup>24</sup> "The action of the internal principle which causes the change or

---

<sup>22</sup>A. Buchenau and Ernst Cassirer, ed., G. W. Leibniz Philosophisches Werke, II, pp. 556-59 quoted in Philip Wiener, ed., Leibniz Selections, p. 185.

<sup>23</sup>"14. L'état passager qui enveloppe et represente une multitude dans l'unité ou dans la substance simple n'est autre chose que ce qu'on appelle la Perception, qu'on doit bien distinguer de l'apperception ou de la conscience, comme il paroitra dans la suit." Gerhardt, Philosophische Schriften, VI, p. 608.

<sup>24</sup>Cf. Ibid., VI, p. 609. Therein Leibniz states: "...4. Ainsi il est bon de faire distinction, entre la Perception qui est l'état intérieur de la Monade représentant les choses externes, et L'Apperception qui est la Conscience, ou la connoissance reflexive de cet état intérieur, laquelle n'est point donnée à toutes les ames, ni toujours à la même ame."

passage from one perception to another may be called appetition."<sup>25</sup> Continuity is present, thus, in the fact that each monad always mirrors the other monads around it, that is "...every substance expresses the whole sequence of the universe in accordance with its own viewpoint or relationship to the rest, so that all are in perfect correspondence to one another."<sup>26</sup>

And finally, continuity is suggested by the fact that all "places" of the universe are occupied by monads, which monads mirror the universe from their particular "place," with different degrees of clarity so that all possible degrees of clarity are accounted for. The monads are always perceiving, even if it is but the smallest amount. There are no leaps in a particular monad's perception. "The perceptions or expressions of external things occur in the soul at a fixed moment by virtue of its own laws, as in a world apart and as if there existed nothing but God and itself...."<sup>27</sup> And "...the series of representations produced in the soul will correspond naturally to the series of changes in the Universe itself:...."<sup>28</sup>

---

<sup>25</sup>"15. L'action du principe interne, qui fait le changement ou le passage d'une perception à une autre, peut être appelé Appetition;...." Ibid.

<sup>26</sup>"C'est à dire chaque substance exprime toute la suite de l'univers selon la vûe ou rapport qui luy est propre, d'où il arrive qu'elles s'accordent parfaitement;...." Ibid., II, p. 47.

<sup>27</sup>"...14....Et les perceptions ou expressions des choses externes arrivant à l'ame à point nommé, en vertu de ses propres loix, comme dans le monde à part, et comme s'il n'existoit rien que Dieu et elle,...." Erdmann, I, p. 127.

<sup>28</sup>"...15. Et cette nature de l'ame étant représentative

As Leibniz states:

15. This hypothesis is indeed possible. For why could not God first give to substance a nature or internal force which could produce in it, in an orderly way, everything which will happen to it (as in a spiritual or formal automaton but free in that it has a share of reason), that is, all the appearances or expressions it will have, and that, without the aid of any creature? All the more so since the nature of substance requires necessarily and conceals a progression or change without which it would not have the force to act.<sup>29</sup>

It is evident from the discussion to this point, that there is a pre-established harmony within the monad itself, as well as a pre-established harmony among the monads in the universe. This harmony is by no means causal, that is:

...Every individual substance is self-complete and its development in time is fixed. No causal relations can arise among monads; at best they can accord with one another in their states. This reciprocal accord extends throughout the universe and links all of its monads in one vast framework of mutual interrelation.<sup>30</sup>

This accord is established anterior to the creation of the

---

de l'Univers d'une manière très-exacte, quoique plus ou moins distincte, la suite des représentations que l'ame se produit, répondra naturellement à la suite des changemens de l'Univers même: comme en échange le corps a aussi été accommodé à l'ame, pour les rencontres ou elle est conçue comme agissante au dehors; ce qui est d'autant plus raisonnable, que les corps ne sont faits que pour les esprits seuls capables d'entrer en société avec Dieu, et de célébrer sa gloire." Ibid., I, p. 128.

<sup>29</sup>"15. Cette hypothèse est très-possible. Car pourquoi Dieu ne pourroit-il pas donner d'abord à la substance une nature ou force interne qui lui pût produire par ordre, (comme dans un automate spirituel ou formel, mais libre en celle qui a la raison en partage) tout ce qui lui arrivera, c'est-à-dire, toutes les apparences ou expressions quelle aura, et cela sans le secours d'aucune créature? D'autant plus que la nature de la substance demande nécessairement et enveloppe essentiellement un progrès ou un changement, sans lequel elle n'auroit point de force d'agir." Ibid., I, pp. 127-28.

<sup>30</sup>Nicholas Rescher, op. cit., p. 55.

actual world. The accord at any instant "of time" is but the consequence of the accord at any previous instant. These interconnections are of an intimate linkage that continues operative in infinite detail<sup>31</sup> through the course of "historical development" of the universe.<sup>32</sup>

Let us pause, and summarize briefly the points established thus far,<sup>33</sup> in this section, regarding "time":

- (1) It seems evident that time has not been considered as a pre-existing receptacle (as it was, in section one) that exists somehow independently of and logically prior to the existence of the substances that are to be placed in it, but rather "time" has been considered as somehow "derived" from the monads.
- (2) There seems to be a "dual nature" to "time," that is, there is a "private-monadic time" (or "intra-

---

<sup>31</sup>A. Buchenau and Ernst Cassirer, ed., G. W. Leibniz Philosophisches Werke, II, pp. 556-59 quoted in Philip Wiener, ed., Leibniz Selections, p. 187. Therein Leibniz states the following: "Now the Law of Continuity demands that when the essential determinations of one being approximate those of another, as a consequence, all the properties of the former should also gradually approximate those of the latter. Hence it is necessary that all the orders of natural being form but a single chain in which different kinds like so many links clasp one another so firmly that it is impossible for the sense and the imagination to fix the exact point where one begins or the other ends;"

Cf. Erdmann, I, p. 118. Therein Leibniz states the following: "Je suis tellement pour l'infini actuel, qu'au lieu d'admettre que la nature l'abhorre, comme l'on dit vulgairement, je tiens qu'elle l'affecte par-tout, pour mieux marquer les perfections de son Auteur. Ainsi je crois qu'il n'y a aucune partie de la matière qui ne soit, je ne dis pas divisible, mais actuellement divisée; et par conséquent la moindre particelle doit être considérée comme un monde plein d'une infinité de creatures différentes."

<sup>32</sup>Admittedly this last phrase is an interpretation, though very problematical, but justified given footnotes 20 and 22.

<sup>33</sup>And in particular, those points which are most relevant to the rest of this section.



monadic time") and a "public-monadic time" (or "inter-monadic time") as the monads in toto, given their interrelatedness, change together.

- (3) Continuity is present throughout the change of states of each monad.

Continuity is present, given the fact that an ever developing monad mirrors the other developing monads, and each of them mirror it.

- (4) "The monads begin all at once and end all at once."

Let us now continue, with hopes of stating the precise sense, of what it means to say that time is relational, on Leibniz's view.

It is my opinion that Leibniz relates a "state" of a particular monad, to an "instant." This is evidenced from the following quotations:

"28. I don't say that two points of space, are one and the same point, nor that two instants of time are one and the same instant,....<sup>34</sup>

...6. That instants, consider'd without the things, are nothing at all; and that they consist only in the successive order of things: which order remaining the same, one of the two states, viz. that of a supposed anticipation, would not at all differ, nor could be discerned from, the other which now is.<sup>35</sup>

---

<sup>34</sup>"28. Je ne dis pas que deux points de l'Espace sont un même point, ny que deux Instans du temps sont us même Instant,...." Gerhardt, Philosophische Schriften, VII, p. 395.

<sup>35</sup>"...6....Les instans hors des choses ne sont rien, et qu'ils ne constistent que dans leur ordre successif, lequel demeurant le même, l'un des deux etats, comme celui de l'anticipation imaginée, ne differeroit en rien, et ne sauroit etre discerné de l'autre que est maintenant." Ibid., VII, p. 364.

Leibniz is talking about things, and it is not directly inferable from the text, whether by "things" he means "monads" or (Leibnizian) "phenomena."

What is to be concluded? Perhaps, the following:

- (1) Instants cannot exist apart from things.
- (2) To each instant corresponds a different "thing-state."
- (3) There is a successive order of different instants and of the corresponding "states of a thing."<sup>36</sup>
- (4) Is Leibniz suggesting, somehow, that "time consists of instants"?<sup>37</sup>

With regard to time, Leibniz states something which at first sight seems quite curious, that is:

49. It cannot be said that [a certain] duration is eternal but [it can be said] that the things which continue always are eternal, [gaining always a new duration.] Whatever exists of time and of duration, [being successive] perishes continually; and how can a thing exist eternally, which (to speak exactly) does never exist at all? For, how can a thing exist, whereof no part does ever exist? Nothing of time does ever exist, but instants; and an instant is not even itself a part of time. Whoever considers these observations, will easily apprehend that time can only be an ideal thing. And the analogy between time and space, will easily make it appear, that the one is as merely ideal as the other. [But, if in saying that the duration of a thing is eternal, it is only meant that the thing endures eternally, I have nothing to say against it.]<sup>38</sup>

---

<sup>36</sup>It seems to me, that (1) through (3) are reminiscent of the earlier mentioned distinction between "intra-monadic states" and "inter-monadic states."

<sup>37</sup>The question posed in (4), as it stands related to the first quote preceding this particular discussion, will be considered shortly.

<sup>38</sup>"49. On ne peut point dire qu'une certaine durée est éternelle; mais on peut dire que les choses qui durent toujours, sont éternelles, en gagnant toujours une durée nouvelle. Tout ce qui existe du temps et de la duration, étant successif, perit continuellement. Et comment une chose pourroit elle exister éternellement, qui à parler exactement n'existe jamais? Car comment pourroit exister une chose, dont jamais aucune

One might interpret this passage, as follows:

- (1) Let "things" refer to "monads."
- (2) In the metaphysical sense, there is no "death" or destruction" of monads but rather their transformation, from state to state.<sup>39</sup>
- (3) A monad is continuously changing states and at no two instants, is the state of the monad the same.<sup>40</sup>
- (4) Since a monad is forever changing states, it is not the case that the monad remains the same (that a particular state of the monad remains the same), hence the monad is not eternal in this sense.<sup>41</sup>
- (5) A monad, since it is a real unity, has no parts, so it is not the case that a particular part of the monad lasts eternally.<sup>42</sup>
- (6) "Nothing of time does ever exist, but instants; and an instant is not even itself a part of time."
- (7) Time is an ideal thing.

Let us, first of all, consider (1) through (5). In order to

---

partie n'existe? Du temps n'existent jamais que des instans, et l'instant n'est pas même une partie du temps. Quiconque considerera ces observations, comprendra bien que le temps ne sauroit etre qu'une chose ideale. Et l'Analogie du temps et de l'espace fera bein juger, que l'un est aussi ideal que l'autre. Cependant si en disant que la duration d'une chose est eternelle, on entend seulement que la chose dure eternellement, je n'ay rien à y redire." Gerhardt, Philosophische Schriften, VII, pp. 402-03.

<sup>39</sup>Cf. supra, n. 16, p. 13.

<sup>40</sup>Cf. supra, n. 34, p. 20.

<sup>41</sup>Cf. supra, n. 35, p. 20.

<sup>42</sup>Cf. supra, n. 14, p. 12.

facilitate this task, a digression seems necessary. To the problem under consideration, Nicholas Rescher makes the following related observation, regarding Leibniz's concept of time, viz.,

The Non-Homogeneity of Time. There is a total lack of homogeneity in time, according to Leibniz. He holds that it is not only impossible that the state of the universe is the same at two different instants but even that every earlier state of the universe has a logical, or natural priority over every later state. Precisely what it is that Leibniz has in mind one can only conjecture. I should suggest that this priority is a consequence of continuity considerations. An earlier instant cannot be interchanged with a later one because this would involve a break in the continuity of the development of the universe.<sup>43</sup>

At this point in the discussion, we seem to have "misplaced" the "notion" of continuity that is present throughout a monad's changes. We find ourselves left with a particular monadic-state in an "instant" and a prior or posterior monadic-state in its "instant." This is slightly inaccurate, for as Leibniz himself states:

When one of two non-contemporaneous elements contains the grounds for the other, the former is regarded as the antecedent, and the latter as the consequent. My earlier state of existence contains the ground for the existence of the latter. And since, because of the connection of all things, the earlier state in me contains also the earlier state of the other thing, it also contains the ground of the later state of the other thing, and is therefore prior to it. All existing elements may be thus ordered either by relation of contemporaneity (co-existence) or by that of being before or after in time.<sup>44</sup>

---

<sup>43</sup>Nicholas Rescher, op. cit., p. 101.

<sup>44</sup>C. I. Gerhardt, ed., Die mathematische Schriften von G. W. Leibniz, Vol. VII (Berlin, 1849-63) pp. 17-28 quoted in Philip Wiener, ed., Leibniz Selections (New York: Charles Scribner's Sons, 1951) pp. 201-02.

Although Leibniz is here talking of "elements," and in particular of one element containing the grounds for the other element, what he does say seems to shed additional light upon the interconnectedness of monads. What appears to be indicated is that the interconnectedness of the monads is more complex than was previously realized. The complexity rests in the factor of an earlier state of a particular monad containing the ground for the existence of the later state, as well as the earlier state of an other monad and the ground of the later state of that other monad.

Let us now return to (6) through (7) and the following statement of Leibniz, namely:

...49. Nothing of time does ever exist, but instants; and an instant is not even itself a part of time. Whoever considers these observations, will easily apprehend that time can only be an ideal thing.<sup>45</sup>

and attempt to clarify it. It seems to me, that Herbert Wildon Carr provides the key, with his observation that:

Space and time in Leibniz's system have their Sufficient Reason in the real world, but they belong to the representative world, the mirrored universe which exists for each monad in its perceptions. They are therefore ideal, not real in themselves; they belong to the world of appearances and not to the noumenal reality. Yet space and time are not themselves appearances, nor are they objects of perception, they belong to the order of perceptions.<sup>46</sup>

---

<sup>45</sup>"...49. Du temps n'existent jamais que des instans, et l'instant n'est pas même une partie du temps. Quiconque considerera ces observations, comprendra bien que le temps ne sauroit etre qu'une chose ideale." Gerhardt, Philosophische Schriften, VII, pp. 402-03.

<sup>46</sup>Herbert Wildon Carr, Leibniz (London: Ernest Benn, Ltd., 1929) p. 153.

What is being suggested in this discussion, and now coming forth, is that for Leibniz the ultimate constituents (the monads) of the universe are not material, not extended, are not in time and space, and cannot move. Given our everyday experiences, we do, in fact, encounter moving [material] objects which move through time and space. So, let us pose this question--in what sense do time and space belong to the phenomenal realm? The answering of this question concerns not only the relationship between "phenomena" and monads, but also the applicability of the terminology of "phenomena" to monads. In regard to the problem of terminology, Ruth Lydia Saw observes that:

Matter and motion, space and time are for Leibniz phenomena bene fundata, that is to say, it will not be suitable to use these terms or any of their derivatives when we are speaking of monads.<sup>47</sup>

Yet there are true statements to be made about the monads which are connected with spatial-temporal statements to be made about the world of appearances....<sup>48</sup>

Relatedly, Nicholas Rescher offers an insight into the relationship between "phenomena" and monads, in regard to "time," through his statement that:

Time (as well as space) is ultimately grounded in the change of states of monads (and in all the monads) and the appetition of the monads (the factor of the monad mirroring, from its own point of view the other monads in the universe).<sup>49</sup>

---

<sup>47</sup>Ruth Lydia Saw, Leibniz (London: Penguin Books, 1959) p. 100.

<sup>48</sup>Ibid., p. 101.

<sup>49</sup>Nicholas Rescher, op. cit., p. 97.

What is becoming apparent is that change is the essence of the monads and the problem has been one of talking about change without time. Leibniz attempts to account for our everyday world (the phenomenal world) in terms of an ultimate constituent (the monad). Time results from (or is derivative from) the properties of the monad.<sup>50</sup> Time concerns the phenomenal order, and more specifically, the relations between objects (material objects), be the relations either contemporaneous or non-contemporaneous.

One can speak of the measurability of time and of duration<sup>51</sup> but this is in regard to the "phenomenal realm" and to the objects therein. Concerning the measurability of time, Nicholas Rescher observes that:

The amount of time between two moments is an exact measure of the number of states of the universe intermediate between them. Into a given amount of time only a certain fixed number of distinct states of the universe can be put, neither more nor less. The amount of time is an exact measure of temporal order, and this can be altered by adding or dropping

---

<sup>50</sup>Of course one is faced with the problem of 'well-founding.' In this regard see Nicholas Rescher, op. cit., p. 81. Therein he states: "Is it the case that the objects with which one deals in the sciences and the phenomena which confront one in everyday life result from properties of the monads that constitute larger-scale-aggregates?"

<sup>51</sup>Cf. Gerhardt, Philosophische Schriften, VII, p. 415. Therein Leibniz states the following: "...105. Je réponds que cela n'est point: car si le temps est plus grand, il y aura plus d'états successifs pareils interposés; et s'il est plus petit, il y en aura moins, puisqu'il n'y a point de vuide ni de condensation ou de penetration, pour ainsi dire, dans les temps, non plus que dans les lieux."

It is to be noted that the problem of the measurability of time, in terms of duration and the continuum, will be considered in greater depth in section three.

some states which, with the actual state of affairs, is impossible.<sup>52</sup>

Leibniz does speak of ideal or mathematical time, according to Nicholas Rescher, "giving it as an example of a continuum where the parts may be assumed in any way, and which is consequently not real, but "ideal."<sup>53</sup> This may be, perhaps, exemplified by Leibniz's statement that:

The parts of time or place, considered in themselves are ideal things; and therefore perfectly resemble one another, like two abstract units. But it is not so with two concrete ones, or with two real times or two spaces filled up, that is truly actual.<sup>54</sup>

Let us now consider first, Newton's conception of time, second, Newton's conception of time as absolute in relation to Leibniz's conception of time as relational, and third, Leibniz and Newton in relation to Kant.

#### 1). Newton's conception of time.

The philosophic position of Isaac Newton was that of scientific materialism. In this regard, Herbert Wildon Carr makes the observation that:

Distrustful of metaphysics, and confining himself to scientific methods of observation and experiment, Newton found himself led to postulate space and time as absolute uniformities. This was in

---

<sup>52</sup>Nicholas Rescher, op. cit., p. 97.

<sup>53</sup>Ibid.

<sup>54</sup>"27. Les parties du temps ou du lieu, prises en elles mêmes, sont des choses ideales; ainsi elles se ressemblent parfaitement, comme deux unites abstraites. Mais il n'en est pas de même de deux Uns concrets, ou de deux temps effectifs, ou de deux espaces remplis, c'est à dire, veritablement actuels." Gerhardt, Philosophische Schriften, VII, p. 395.



effect to affirm scientific materialism....The direct effect of this empirical principle appeared to be to establish the reality of material corporeal existence as the basis of all knowledge. Mind could be conceived as an impressible corporeal organ, Nature as a boundless expanse or immobile extension, within which masses of matter, possessing the peculiar force, attraction, move with varying velocities subject to mechanical laws.<sup>55</sup>

Newton's theory of time is presented in a "Scholium to Definition VIII" of the Philosophiae Naturalis Principia Mathematica. In the Scholium, Newton distinguishes between absolute and relative, true and apparent, mathematical and common time. Let us look at four passages in the "Scholium to Definition VIII," namely:

I. Absolute, true, and mathematical time, of itself, and from its own nature, flows equably without relation to anything external, and by another name is called duration: relative, apparent, and common time, is some sensible and external (whether accurate or unequable) measure of duration by the means of motion, which is commonly used instead of true time; such as an hour, a day, a month, a year.<sup>56</sup>

---

<sup>55</sup>Herbert Wildon Carr, op. cit., p. 155.

Cf. J. T. Frazer ed., The Voices of Time (New York: George Braziller, 1966), p. 18. The following is noted therein: "Near the end of his Principles he stated definitely, 'I frame no hypothesis; for whatever is not deduced from the phenomena is to be called a hypothesis; and hypotheses, whether metaphysical or physical, whether of occult qualities or mechanical, have no place in experimental philosophy.' There is evidence throughout Newton's writings that he did not adhere rigidly to this principle. But the deliberate introduction of absolute time, space and motion, which are clearly unobservable, seems such a flagrant violation of the empirical spirit of his entire philosophy that it cries out for justification. He prefaced the introduction of these absolutes by admitting that he did not define time, space, and motion in accordance with the way in which they are ordinarily understood. 'The common people conceive these quantities under no notions but from the relation they bear to sensible objects.' ...He insisted that 'in philosophical disquisitions, we ought to abstract from our senses, and consider things themselves, distinct from what are only sensible measures of them.'"

<sup>56</sup>"I. Tempus Absolutum, verum, & mathematicum, in se &

...IV. Absolute time, in astronomy, is distinguished from the relative, by the equation or correction of the apparent time. For the natural days are truly unequal, though they are commonly considered as equal, and used for a measure of time; astronomers correct this inequality that they may measure the celestial motions by a more accurate time. It may be, that there is no such thing as an equable motion, whereby time may be accurately measured. All motions may be accelerated and retarded, but the flowing of absolute time is not liable to any change. The duration or perseverance of the existence of things remains the same, whether the motions are swift or slow, or none at all: and therefore this duration ought to be distinguished from what are only sensible measures thereof; and from which we deduce it, by means of the astronomical equation.<sup>57</sup>

...IV. As the order of the parts of time is immutable, so also is the order of the parts of space. Suppose those parts to be moved out of their places, and they will be moved...out of themselves. For times and spaces are, as it were, the places as well of themselves as of all other things. All things are places in time as to order of succession and in space as to order of situation. It is from their essence or nature that they are places; and that the primary places of things should be movable, is absurd. There are therefore the absolute places; and translations out of those places, are the only absolute motions.<sup>58</sup>

---

natura sua, sine relatione ad externum quodvis, aequabiliter fluit, alioque nomine dicitur Duratio: Relativum, apparens, & vulgare est sensibilis & externa quaevis durationis per motum mensura (seu accurata seu inaequalis) qua vulgus vice veri temporis utitur, ut hora, dies, mensis, annus." Samuel Horsley, ed., Isaaci Newtoni Opera quae exstant Omnia, II (Londini: Excudebat Joannes Nichols, 1779), p. 6.

<sup>57</sup>"...IV. Tempus Absolutum a Relativo distinguitur in Astronomia per aequationem temporis vulgi. Inaequales enim sunt dies naturales, qui vulgo tanquam aequales pro mensura temporis habentur. Hanc inaequalitatem corrigunt Astronomi, ut ex veriore tempore mensurent motus coelestes. Possibile est, ut nullus sit motus aequabilis, quo tempus accurate mensuretur. Accelerari & retardari possunt motus omnes, sed fluxus temporis absoluti mutari nequit. Eadem est duratio seu perseverantia existentiae rerum, sive motus sint celeres, sive tardi, sive nulli: proinde haec a mensuris suis sensibilibus merito distinguitur & ex iisdem colligitur per aequationem astronomicam." Ibid., pp. 7-8.

<sup>58</sup>"...IV. Ut ordo partium temporis est immutabilis, sic etiam ordo partium spatii. Moveantur hae de locis suis, &

Wherefore relative quantities are not the quantities themselves, whose names they bear, but those sensible measures of them (either accurate or inaccurate), which are commonly used instead of the measured quantities themselves. And if the meaning of words is to be determined by their use, then by the names time, space, place and motion, their sensible measures are properly to be understood; and the expression will be unusual, and purely mathematical, if the measured quantities themselves are meant. On this account, those violate the accuracy of language, which ought to be kept precise, who interpret these words for the measured quantities. Nor do those less defile the purity of mathematical and philosophical truths, who confound real quantities with their relations and sensible measures.<sup>59</sup>

Let us pause for a moment, and state, as clearly as possible, the basic claims of Newton's theory, given the above. Thus:

- (1) Newton differentiates between absolute, true and mathematical time and relative, apparent and common time.
- (2) Absolute, true and mathematical time flows without relation to anything whereas relative, apparent and

---

movebuntur (ut ita dicam) de seipsis. Nam tempora & spatia sunt sui ipsorum & rerum omnium quasi loca. In tempore quoad ordinem successionis, in spatio quoad ordinem situs, locantur universa. De illorum essentia est, ut sint loca: & loca primaria moveri absurdum est. Haec sunt igitur Absoluta Loca; & solae translationes de his locis sunt Absoluti Motus." Ibid., p. 8.

<sup>59</sup>"...IV. Quantitates relativae non sunt igitur eae ipsae quantitates, quarum nomina prae se ferunt, sed sunt earum mensurae illa sensibiles (verae an errantes) quibus vulgus, loco quantitatum mensuratarum, utitur. At si ex usu definiendae sunt verborum significationes; per nomina illa Temporis, Spatii, Loci & Motus proprie intelligendae erunt hae mensurae sensibiles; & sermo erit insolens & pure mathematicus, si quantitates mensuratae hic intelligantur. Proinde vim inferunt sacris literis, qui voces hasce de quantitativibus mensuratis ibi interpretantur. Neque minus contaminant Mathesin & Philosophiam, qui quantitates veras cum ipsarum relationibus & vulgaribus mensuris confundunt." Ibid., p. 11.

common time is some sensible and external measure of duration by means of motion.

- (3) Absolute time in astronomy is distinguished from relative time, by the equation or correction of the apparent time which is unequal.
- (4) The duration of absolute time must be distinguished from the duration of relative time because the motions used to measure relative time may be swift or slow or none at all and the duration of absolute time is not subject to change.
- (5) The order of the parts of time is unchanged.
- (6) All things are placed in time as to order of succession.
- (7) One ought to be careful and not confound mathematical measures of time with relative (sensible) measures of time or vice versa.

With this in view, let us continue with hopes of clarifying the phrase "absolute, true and mathematical time," which phrase seems to me to be the key to understanding the just quoted sections of the Scholium.

Newton believed that certain dynamical phenomena require a distinction between absolute and relative acceleration, between absolute and relative motion, i.e.,

Newton believed the laws of motion presupposed the existence of an absolute time and space in which bodies could truly, rather than merely relatively, be said to be in motion. A body that appears to be in accelerated motion relative to some material reference frame would only appear to be in the presence of forces relative to that frame and would

appear to be free of forces relative to some other reference frame. Although Newton admitted that, in general, measurements of velocity must be made relative to a material reference frame, he claimed that the presence of absolute motion could be distinguished from relative motion....<sup>60</sup>

Newton also believed that the existence of absolute motion implies the existence of absolute space and absolute time.

His observation is as follows:

...A waterfilled bucket hanging by a rope is subjected to the following sequence of events (1) The rope is twisted and then released so that the bucket begins to rotate; in the initial stages of this rotation, the bucket is in motion relative to the water and the surface is flat. (2) Shortly thereafter, the water begins to rotate also, until it finally reaches a state in which it is at rest relative to the bucket; now its surface is curved. (3) The bucket is stopped abruptly; again the water is rotating relative to the bucket, as in (1), but this time its surface is curved. (4) Finally, the water again comes to rest relative to the bucket, but unlike the situation in (2), its surface is now flat.<sup>61</sup>

What is the significance of this observation, according to Newton?

Newton argued that since the surface of the water can be either flat or curved regardless of the state of the bucket to which its motions are referred, the water's rotation cannot be made a function of the reference frame and so must be real, not only relative, and that this absolute motion implies the existence of an absolute space and time in which this motion takes place.<sup>62</sup>

According to Kaith Emerson Ballard,

The basic claim of Newton's theory is that space is

---

<sup>60</sup>Dudley Shapere "Isaac Newton," Encyclopedia of Philosophy, XV, p. 495.

<sup>61</sup>Ibid.

<sup>62</sup>Ibid.

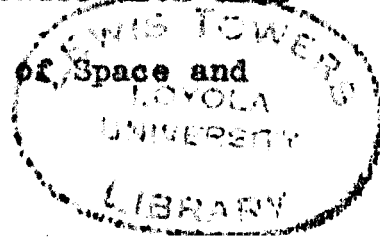
logically prior to matter and has an existence independent of matter, and that time is also prior to and exists independently of events or processes. That is to say, matter could not exist without some space in which to reside, nor could events or processes exist without some time in which they occur, and through which they endure. But space would exist, in exactly the same sense as it does now, even if there were no matter to occupy it; and time would exist even if there were no events or processes to occur in it and to endure through it.<sup>63</sup>

Let us briefly summarize what has just been stated, that is:

- (1) Space and time are prior to matter, events and processes.
- (2) Space and time are not dependent upon the existence of matter, events and processes.
- (3) Space and time would exist in exactly the same fashion were there or were there not bodies.

It is my opinion that points (1) through (3) just cited, refer to the existence of absolute time and space but absolute time and space are here viewed in a different way than previously, that is, one is not now considering different relative frames of reference as opposed to an absolute frame of reference, with regard to certain dynamical phenomena. Points (1) through (3) concern the existence of absolute time and space prior to the existence of any world, any matter. Given the fact that this world exists, that matter exists, we then talk of absolute time, space, and motion and relative time, space, and motion in terms of frames of reference. These "two ways" of viewing absolute space and time are of significance, because with them

<sup>63</sup>Kaith Emerson Ballard, "Leibniz's Theory of Space and Time," J. Hist. Ideas, XXI (1960), 50.



one is enabled to differentiate, however finely, between absolute time without regard to the existence of bodies and absolute mathematical time in terms of an absolute frame of reference which has regard to the existence of bodies.

ii). Some comparisons between Leibniz's relational conception of time and Newton's absolute conception of time.

The points of comparison are the following:

- (1) Leibniz provided a metaphysical foundation for phenomena.

Newton was distrustful of metaphysics; thus he confined himself to the scientific methods of experimentation and observation.

- (2) On Leibniz's view, time is the form of order among phenomena.

On Newton's view, time can be thought of as relative, apparent and common and/or absolute, true and mathematical.

- (3) Given the existence of the world, Newton differentiates between absolute mathematical measures of time and sensible mathematical measures of time, in terms of frames of reference.

Leibniz's view of time, being tied to the relations among things, would be a mathematical measure based upon abstraction from things (or a relative, sensible apparent measure).

- (4) On Leibniz's view it is not meaningful to raise the question as to what moment of time the world was

created, for time comes into existence with the creation of this actual world.

On Newton's view it is meaningful to raise the question as to what moment of time the world was created, for absolute time exists prior to this actual world with its matter, events and processes.

- (5) Leibniz, in his relational view of time, denied time (as well as space) to be the ultimate framework of the universe.<sup>64</sup>

Newton did not deny time (as well as space) to be the ultimate framework of the universe.

---

<sup>64</sup>Time, resulting from the properties of the monads (especially change and appetition or the mirroring of one monad by another), concerns the "phenomenal realm," that is, the relations between objects.



## CHAPTER THREE

### TIME AS AN IDEALIZATION OF THE EXISTING RELATIONS BETWEEN THINGS

This chapter and the next will investigate further the relational conception of time. In particular, this chapter will consider the sense of Leibniz's position that 'time is but a mere idealization of the existing relations between things,' whereas the next chapter will consider why 'it is not meaningful, on Leibniz's view, to raise the question as to what moment of time the world was created.'

The expressing of the sense of the position that 'time is an idealization of the existing relations between things' seems to involve, at the very least, two steps,<sup>65</sup> namely:

- (A) the explaining of what it means to say that time is the form of order among phenomena,
- (B) the explaining of how time, being tied to the relations among things, is a mathematical measure based upon abstraction from things (or how time is a relative, sensible, apparent measure).

The two steps themselves rest upon a differentiation between

- (1) actual time
- (2) absolute time

---

<sup>65</sup>Step (A) is comparison two listed in chapter two, subsection ii, p. 34. Step (B) is comparison three listed in chapter two, subsection ii, p. 34.

(3) time as an idea in God's mind

(4) mathematical time

(5) mathematical infinite and true infinite (eternity).

Distinctions one, two and three give us a partial explanation of step (A), whereas one, four and five give us an explanation of step (B).

Before proceeding onward with discussion of steps (A) and (B), an observation seems in order. The observation is as follows. As this chapter progresses, the conceptions of time which come into increasing importance are actual time and mathematical time. These conceptions are really "a conception." The conception appears to make sense of the position that 'time is an idealization of the existing relations between things.' This being said, let us now turn to consideration of step (A).

(A) A partial explanation of what it means to say that time is the form of order among phenomena.

As previously noted, the explanation of what it means to say that time is the form of order among phenomena rests, in part, upon the differentiation between (1) actual-ideal time, (2) absolute-ideal time and (3) time as an idea in God's mind. The consideration of actual-ideal time and absolute-ideal time involves discussion of (a) the origin of men's notion of actual space and absolute space and (b) the origin of men's notion of actual time and absolute time. The consideration of time as an idea in God's mind leads to examination of the relationship between actual-ideal time and time as an idea in God's mind.

Since the momentum for step (A) is derived from the differentiations, let us turn to them.

What, therefore, is the meaning of (1) actual time and of (2) absolute time in Leibniz's view? The answering of this question is facilitated by examining the origin of men's notion of time. Since space and time stand in an analogous relationship, it seems helpful to consider first, the problem of how men come to form the notion of absolute space, and then of time. Surprisingly enough, the reader will discover that Leibniz talks of the origin of men's notion of duration, and not of time. So, one is led into the examination of the relationship between duration and time.

Leibniz offers the following rather lengthy account, of how men can arrive at a notion of space without need of supposing any absolute reality, beyond consideration of the situation of things.

47. I will here show, how men come to form to themselves the notion of space. They consider that many things exist at once and they observe in them a certain order of co-existence, according to which the relation of one thing to another is more or less simple. This order, is their situation or distance. When it happens that one of those co-existent things changes its relation to a multitude of others, which do not change their relation among themselves; and that another thing, newly come, acquires the same relation to the others, as the former had; we then say, it is come into the place of the former; and this change, we call a motion in that body, wherein is the immediate cause of the change. And though many, or even all the co-existent things, should change according to certain known rules of direction and swiftness; yet one may always determine the relation of situation, which every co-existent acquires with respect to every other co-existent; and even that relation which any other co-existent would have to this, or which this would have to any other, if it had

not changed, or if it had changed any otherwise. And supposing, or feigning, that among those co-existents, there is a sufficient number of them, which have undergone no change; then we may say, that those which have such a relation to those fixed existents, as others had to them before, have now the same place which those others had. And that which comprehends all those places, is called space. Which shows, that in order to have an idea of place, and consequently of space, it is sufficient to consider these relations, and the rules of their changes, without needing to fancy any absolute reality outside the things whose situation we consider.<sup>66</sup>

So, according to the view of Leibniz, men consider that many things exist at once and observe a certain order of co-existence among the simultaneously existing things. This order of co-existence is more or less a simple relation of one thing to another, which relation is the situation or distance of one thing from another. A co-existing thing changes its relation

66<sup>47</sup>. Voicy comment les hommes viennent à se former la notion de l'espace. Ils considerent que plusieurs choses existent à la fois, et ils y trouvent un certain ordre de coexistence, suivant lequel le rapport des uns et des autres est plus ou moins simple. C'est leur situation ou distance. Lorsqu'il arrive qu'un de ces coexistens change de ce rapport à une multitude d'autres, sans qu'ils en changent entre eux, et qu'un nouveau venu acquiert le rapport tel que le premier avoit eu à d'autres, on dit qu'il est venu à sa place, et on appelle ce changement un mouvement qui est dans celui où est la cause immediate du changement. Et quand plusieurs, ou même tous, changeroient selon certaines regles connues de direction et de vitesse, on peut toujours determiner le rapport de situation que chacun acquiert à chacun; et meme celui que chaque autre auroit ou qu'il auroit a chaque ature, s'il n'avoit point changé, ou s'il avoit autrement changé. Et supposent ou feignant que parmy ces coexistens il y ait un nombre suffisant de quelque uns, qui n'ayent point eu de changement en eux, on dira que ceux qui ont un rapport à ces existens fixes, tel que d'autres avoient auparavant à eux, ont eu la meme place que ces derniers avoient eue. Et ce qui comprend toutes ces places, est appellé Espace. Ce qui fait voir que pour avoir l'idée de la place, et par consequent de l'espace, il suffit de considerer ces rapports et les regles de leur changemens, sans avoir besoin de se figurer icy aucune realité absolue hors des choses dont on considere la situation." Gerhardt, Philosophische Schriften, VII, p. 400.

to a multitude of other co-existing things (which "other" co-existing things do not change their relation among themselves). This change (of relation, of place) is called "a motion in that body, wherein is the immediate cause of the change." The "newly-come" thing, conceived as "that body," has motion within itself. The motion within the "newly-come" thing is the immediate cause of the change. "For when the immediate cause of the change is in the body, that body is truly in motion; and then the situation of other bodies, with respect to it, will be changed consequently, though the cause of that change be not in them."<sup>67</sup>

The relation of situation, which every co-existent acquires with regard to every other co-existent, can be determined. The relation of situation (which any co-existent would have to every other co-existent or every other co-existent to any other) can be determined regardless of whether the relation between co-existing things has changed or has not changed. Let it be assumed that among the number of things co-existing,

---

<sup>67</sup>"53. Je ne trouve rien dans la definition huitieme des principes Mathematiques de la Nature, ny dans le Scholie de cette definition, qui prouve, ou puisse prouver la realité de l'espace en soy. Cependant j'accorde qu'il y a de la difference entre un mouvement absolu veritable d'un corps, et un simple changement relatif de la situation par rapport à un autre corps. Car lorsque la cause immediate du changement est dans le corps, il est veritablement en mouvement; et alors la situation des autres par rapport à luy, sera changee par conséquence, quoyque la cause de ce changement ne soit point en eux. Il est vray qu'à parler exactement, il n'y a point de corps qui soit parfaitement et entierement en repos; mais c'est de quoy on fait abstraction, en considerant la chose mathematiquement." Ibid., VII, p. 404.

there is a sufficient number of them which undergo no change of place and let us term the sufficient number of things undergoing no such change of place, fixed existent. Those things which have such a relation to these fixed existents, as others had to them before, have now the same place which these others had. That comprehending all those places, is called space.

Upon review of the passage just considered, what seems to become apparent, is the need for clarification of the distinction between place and situation. Leibniz does offer such a clarification:

And here it may not be amiss to consider the difference between place, and the relation of situation, which is in the body that fills up the place. For the place of A and B, is the same; whereas the relation of A to fixed bodies, is not precisely and individually the same, as the relation which B (that comes into its place) will have to the same fixed bodies; but these relations agree only. For, two different subjects, as A and B, cannot have precisely the same individual affection; it being impossible, that the same individual accident should be in two subjects, or pass from one subject to another.<sup>68</sup>

Given the prior considerations, how is it possible for men to form a notion of absolute space? In attempting to answer this question, Leibniz considers two examples of how the mind forms the notion. The first example is as follows:

---

68 "...47. Et il est bon icy de considerer la difference qu'il y a entre la place et entre le rapport de situation du corps qui occupe la place. Car la place d'A et de B est la même, au lieu que le rapport d'A aux corps fixes, n'est pas precisement et individuellement le même que le rapport que B (qui prendra sa place) aura aux mêmes fixes; et ces rapports conviennent seulement. Car deux sujets differens, comme A et B, ne sauroient avoir precisement la même affection individuelle; un même accident individuel ne se pouvant point trouver en deux sujets, ni passer de sujet en sujet." Ibid., VII, pp. 400-01.

And here it may not be amiss to consider the difference between place, and the relation of situation, which is in the body that fills up the place. For, the place of A and B, is the same; whereas the relation of A to fixed bodies, is not precisely and individually the same, as the relation which B (that comes into its place) will have to the same fixed bodies; but these relations agree only. For two different subjects, as A and B, cannot have precisely the same individual affection; it being impossible, that the same individual accident should be in two subjects, or pass from one subject to another. But the mind not contented with an agreement, looks for an identity, for something that should be truly the same; and conceives it as being extrinsic to the subject: and this is what we here call place and space. But this can only be an ideal thing; containing a certain order, wherein the mind conceives the application of relations.<sup>69</sup>

Briefly expressed, what is Leibniz's first example of how the mind forms the notion of absolute space? Bodies A and B differing intrinsically do not share exactly the same accidents. Suppose B now occupies the same place that A formerly occupied. The relation of A to the fixed existents when it occupied the place now occupied by B, is not the same as B's present relation to the fixed existents. How is it possible that the relation of situation between A and the fixed existents

---

<sup>69</sup>"...47. Et il est bon icy de considerer la difference qu'il y a entre la place et entre le rapport de situation du corps qui occupe la place. Car la place d'A et de B est la même, qu lieu que le rapport d'A aux corps fixes, n'est pas precisement et individuellement le même que le rapport que B (qui prendra sa place) aura aux mêmes fixes; et ces rapports conviennent seulement. Car deux sujets differens, comme A et B, ne sauroient avoir precisement la même affection individuelle; un même accident individuel ne se pouvant point trouver en deux sujets, ni passer de sujet en sujet. Mais l'esprit non content de la convenance, cherche une identité, une chose qui soit veritablement la même, et la concoit comme hors de ces sujets; et c'est ce qu'on appelle icy place et espace. Cependant cela ne sauroit etre qu'ideal, contenant un certain ordre où l'esprit concoit l'application des rapports: comme l'esprit se peut figurer un ordre consistant en lignes Genealogiques, dont les grandeurs ne consisteroient que dans le nombre des generations où chaque personne auroit sa place." Ibid.

and B and the fixed existents idffers, although B now occupies the former place of A? The relation of situation differs because bodies A and B do not share exactly the same accidents, the same individual affections. The mind looks for an identity, that is, something extrinsic to both A and B that should be truly the same. Given the fact that the relation of situation differs for A and B and that place remains the same for A and B, the mind fixes upon the notion of place as that something which is extrinsic to both A and B. That which is extrinsic to A and B (i.e., place) is also called space.<sup>70</sup>

<sup>70</sup>Cf. Ibid., VII, p. 415. Therein Leibniz notes that: "104. Je ne dis point que l'Espace est un ordre ou une situation qui rend les choses situables; ce seroit parler galimatias. On n'a qu'à considerer mes propres paroles, et à les joindre a ce qui je viens de dire cy dessus, num. 47, pour montrer comment l'esprit vient à se former l'idée de l'Espace, sans qu'il faille qu'il y air un Etre réel et absolu, qui y reponde, hors de l'esprit et hors des rapports. Je ne dis donc point, que l'Espace est un ordre ou situation, mais un ordre des situations, ou selon lequel les situations sont rangées; et que l'espace abstrait est cet ordre de situations, concues comme possibles. Ainsi c'est quelque chose d'ideal, mais il semble qu'on ne me veut point entendre. J'ay repondu deja icy num. 54 à l'objection qui pretend qu'un Ordre n'est point capable de quantité."

With regard to the above passage (that is, number 104), passage number 47 to which Leibniz refers, is the passage presently under discussion, which discussion extends from page thirty-eight to page forty-five in the body of this paper. Passage number 54 is as follows: "54. Je ne connois aucune objection à laquelle je ne croye d'avoir repondu suffisamment. Et quant à cette objection, que l'Espace et le Temps sont des quantites, ou plustost des choses douées de quantité, et que la situation et l'ordre ne le sont point, je reponds que l'ordre a aussi sa quantité; il a ce qui precede et ce qui suit, il y a distance ou intervalle. Les choses Relatives ont leur quantité, aussi bien que les Absolues: par exemple, les Raisons ou proportions dans les Mathematiques ont leur quantité, et se mesurent par les Logarithmes; et cependant ce sont des Relations. Ainsi quoyque le Temps et l'Espace consistent en rapports, ils ne laissent pas d'avoir leur quantité." Ibid., VII, p. 404.



The second example, of how the mind forms the notion of absolute space, is as follows:

I shall allege another example, to show how the mind uses, upon occasion of accidents which are in subjects, to fancy to itself something answerable to these accidents, out of the subjects. The ratio or proportion between two lines *L* and *M*, may be conceived three several ways; as a ratio of the greater *L*, to the lesser *M*; as a ratio of the lesser *M*, to the greater *L*; and lastly, as something abstracted from both, that is, the ratio between *L* and *M*, without considering which is the antecedent, or which the consequent; which the subject, and which the object. And thus it is, that proportions are considered in music. In the first way of considering the, *L* the greater; in the second, *M* the lesser, is the subject of that accident, which philosophers call relation. But, which of them will be the subject, in the third way of considering them? It cannot be said that both of them, *L* and *M* together, are the subject of such an accident; for if so, we should have an accident in two subjects, with one leg in one, and the other in the other; which is contrary to the notion of accidents. Therefore we must say, that this relation, in this third way of considering it, is indeed out of the subjects; but being neither a substance, nor an accident, it must be a mere ideal thing, the consideration of which is nevertheless useful.<sup>71</sup>

---

71" ...47. Je donneray encore un exemple de l'usage de l'esprit de se former, a l'occasion des accidens qui sont dans les sujets, quelque chose qui leur reponde hors des sujets. La raison ou proportion entre deux lignes *L* et *M* peut etre concue de trois facons: comme raison du plus grand *L* au moindre *M*, comme raison du moindre *M* au plus grant *L*, et enfin comme quelque chose d'abstrait des deux, c'est a dire comme la raison entre *L* et *M*, sans considerer lequel est l'antérieur ou le postérieur, le sujet ou l'objet. Et c'est ainsi que les proportions sont considérées dans la Musique. Dans la premiere consideration, *L* le plus grand est le sujet; dans la seconde, *M* le moindre est le sujet de cet accident, que les philosophes appellent relation ou rapport. Mais quel en sera le sujet dans le troisieme sens? On ne sauroit dire que tous les deux, *L* et *M* ensemble, soyent le sujet d'un tel accident, car ainsi nous aurions un Accident en deux sujets, qui auroit une jambe dans l'un, et l'autre dans l'autre, ce qui est contre la notion des accidens. Donc il faut dire, que ce rapport dans ce troisieme sens est bien hors des sujets; mais que n'étant ny substance ny accident, cela doit etre une chose purement ideale, dont la consideration ne laisse pas d'etre utile." *Ibid.*, VII, p. 401.

The problem that Leibniz is confronting is that of accounting for space without needing to fancy any absolute reality. At the end of the first example, Leibniz states that consideration of space as somehow extrinsic to A and B is an ideal thing. Here Leibniz is stating basically the same as he stated in the first example, but with regard to L and M (that is, here he is showing how mind uses, upon the occasion of accidents which are in subjects, to fancy to itself something answerable to these accidents, outside the subjects). The problem seems to be that of fancying the "ideal thing," which is extrinsic to L and M, as an absolute reality.

It must be remembered that Leibniz holds a relational conception of space and time. The origin of man's notion of the relational conception of space has been just considered. Men, in considering the relational conception of space, seem to move beyond this conception and fancy an "ideal thing" as an absolute reality. That is, men fancy "ideal space" as absolute space or actual space as absolute space. The reason, for examining Leibniz's notion of the origin both of space and of absolute space, was to be able to locate his notion of absolute time. Since space and time stand in an analogical relation, is one now permitted to say, given certain textual support, that men fancy "ideal time" as absolute time or actual time as absolute time? The answer is no. Leibniz does not offer a comparable discussion of time. This is to say that, Leibniz does not discuss (i) how men come to form the notion of time, of actual time and (ii) how men come

to form the notion of absolute time. Yet, Leibniz does relate 'how the constant train of ideas in our mind furnishes us with the idea of duration.'<sup>72</sup>

Before proceeding onward, a few brief remarks seem in order. First of all, we set upon the task of attempting to differentiate between (1) actual time and (2) absolute time. Secondly, the distinctions behind us are hardly textually justified. Thirdly, since no further light is able to be shed on the absolute time distinction, it seems appropriate to withdraw from further consideration of it. And fourthly, since further consideration of actual time leads to fruitful results, it will be subject to subsequent development.

As was previously stated, the distinction between (1) actual time and (4) mathematical time fails in the sense that it leads to a conception of time which is, in essence, a relative, sensible, apparent measure. This relative, sensible, apparent measure is a mathematical measure based upon abstraction from things actually existing. Yet, a question seems in order. If the distinctions of actual time and mathematical time fail, why the distinctions? It is my opinion that important light can be shed upon Leibniz's notion of time as an idealization of the existing relations between things, given the distinction. In the example of space, it was possible to talk about actual space, that is, the spatial relations among actually existing things in terms of place and relation of

---

<sup>72</sup> Leibniz's notion of duration is discussed shortly, following the discussion of (3) time as an idea in God's mind.

situation. Leibniz says that consideration of space is an ideal thing which is, in fact, useful. Space is not the ultimate framework of the universe just as time is not, that is, space and time are not properties of monads. Time, not being a property of a monad, is an ideal thing which expresses the relation between non-contemporaneous things. Granted this, the distinctions of actual-ideal space and actual time seem useful. There is, however, an additional way of viewing the actual time distinction, which leads into discussion of (3) time as an idea in God's mind.

Let us, therefore, examine the texts wherein Leibniz discusses time as an idea within God's mind. The texts are:

59. When I speak of this world, I mean the whole universe of material and immaterial creatures taken together, from the beginning of things. But if any one mean only the beginning of the material world, and suppose immaterial creatures before it; he would have somewhat more reason for his supposition. For time then being marked by things that existed already, it would be no longer indifferent; and there might be room for choice. And yet indeed, this would be only putting off the difficulty. For, supposing the whole universe of immaterial and material creatures together, to have a beginning; there is no longer any choice about the time, in which God would place that beginning.<sup>73</sup>

---

<sup>73</sup>59. Quand je parle de ce monde, j'entends tout l'univers des creatures materielles et immaterielles prises ensemble, depuis le commencement des choses; mais si l'on n'entendoit que le commencement du monde materiel, et supposoit avant luy des creatures immaterielles, on se mettroit un peu plus à la raison en cela. Car le temps alors estant marqué par les choses qui existeroient déjà, ne seroit plus indifferent; et il y pourroit avoir du choix. Il est vray qu'on ne feroit que differer la difficulté, car supposant que l'univers entier des creatures immaterielles et materielles ensemble a commencé, il n'y a plus de choix sur le temps où Dieu le voudroit mettre." Gerhardt, Philosophische Schriften, VII, p. 406.

106. 'Tis true, the immensity and eternity of God would subsist, though there were no creatures; but those attributes would have no dependence either on times or places. If there were no creatures, there would be neither time nor place, and consequently no actual space. The immensity of God is independent upon space, as his eternity is independent upon time. These attributes signify only, [with regard to these two orders of things] that God would be present and co-existent with all the things that should exist. And therefore I don't admit what's here alleged, that if God existed alone, there would be time and space as there is now: whereas then, in my opinion, they would be only in the ideas of God as mere possibilities. The immensity and eternity of God, are things more transcendent, than the duration and extension of creatures; not only with respect to the greatness, but also to the nature of the things. Those divine attributes do not imply the supposition of things extrinsic to God, such as are actual places and times. These truths have been sufficiently acknowledged by divines and philosophers.<sup>74</sup>

So, by world Leibniz means the whole universe of both material and immaterial creatures taken together from the beginning of things. Since the immensity and eternity of God would subsist

---

<sup>74</sup>"106. Je soutiens que sans les Creatures, l'immensité et l'Eternité de Dieu ne laisseroient pas de subsister, mais sans aucune dependance ny des temps ny des lieux. S'il n'y avoit point de creatures, il n'y auroit ny temps ny lieux; et par consequent point d'espace actuel. L'immensité de Dieu est independante de l'espace, comme l'éternité de Dieu est independante du Temps. Elles portent seulement à l'égard de ces deux ordres de choses, que Dieu seroit present et coexistant à toutes les choses qui existeroient. Ainsi je n'admets point ce qu'on avance icy, que si Dieu seul existoit, il y auroit temps et espace, comme à present. Au lieu qu'alors, à mon avis, ils ne seroient que dans les idées, comme des simples possibilités. L'immensité et l'éternité de Dieu sont quelque chose de plus eminent que la durée et l'étendue des creatures, non seulement par rapport à la grandeur, mais encore par rapport à la nature de la chose. Ces attributs Divins n'ont point besoin de choses hors de Dieu, comme sont les lieux et temps actuels. Ces verités ont été assés reconnues par les Theologiens et par les Philosophes." *Ibid.*, VII, pp. 415-16.

though there were no creatures, they have no dependence upon times or places. If there were no creatures there would be neither time nor place, and consequently no actual space. The immensity of God is independent of space, as his eternity is independent of time. Immensity and eternity signify only as regards the two orders of things, that God would be present and co-exist with all the things that should exist. If God existed alone, there would not be time and space, as there is now. If God existed alone, time and space would be only in the ideas of God as mere possibilities. The immensity and eternity of God are things more transcendent than the duration and extension of creatures. Immensity and eternity do not imply the supposition of things extrinsic to God, such as are actual places and times.

What is the significance of the above texts? First of all, it is noticeable that the distinction of time as an idea within God's mind is now textually supported. That is, if God existed alone, time (and space) would be only in the ideas of God as a mere possibility. Secondly, it is notable that the distinction of actual times (and places) is made mention of. So, let us ask in what sense these above mentioned points stand related. It is my belief that Leibniz is contrasting them. But what does this mean? God, before actualization of a best possible world, has in His mind an infinite number of possible worlds with their possible laws. This actual world, as it exists in God's mind as a possibility, has its temporal and spatial relations as mere possibilities among the ideas

of God. When the best possible world is actualized, so are time and space as they are in the ideas of God as possibilities. When time and space are actualized along with the world, one then has an actual world with its actual time and actual space. Such things extrinsic to God are actual times and actual places.

If the reader will recall, the problem in step (A) is to give a partial explanation of what is meant by saying that time is the form of order among things. This problem exists within the greater task of attempting to ascertain what Leibniz means by saying that 'time is an idealization of the existing relations among things.'

Thus far, our analyses have culminated in the contrast between time as an idea in God's mind and actual time. From the analyses, it seems possible to interpret actual time as expressing the form of order among actually existing things in contrast to time as the form of order among things existing in God's mind as possibilities. But, this seems unsatisfactory to the extent that "form of order" is left unexplained. Nevertheless, the contrast may be viewed as a major find. This is true to the extent that it enables us to shift our perspective with regard to actual time. With this shift, we are able to place actual time in a mathematical perspective. This allows us, in my opinion, to claim that by "form of order" Leibniz means the non-contemporaneous relations among things (that is, the universal order of change).

- (B) The explanation of how time, being tied to the relations among things, is a mathematical measure based upon abstraction from things (or how time is a relative, sensible, apparent measure).

As stated at the beginning of this chapter, the explanation of step (B) rests upon the differentiation between (1) actual time, (4) mathematical time and (5) mathematical infinite and true infinite (eternity). This step is directly related to step (A) through the actual time distinction. In step (B), a change of perspective occurs with regard to actual time. Actual time is no longer contrasted with time as an idea in God's mind. Rather, it is placed in a mathematical perspective. This is to say that actual time is related to mathematical time such that both merge into a relative, sensible, apparent, mathematical measure of time.

The unraveling of the mathematical time distinction leads into examination of (a) the origin of the mind's idea of duration, (b) the relationship between space, extension and matter, and (c) the relationship between time, duration and motion, in terms of the distinction between actual time and mathematical time. Following the discussion of mathematical time, the mathematical infinite and the true infinite (eternity) are discussed.

Prior to effecting the change of perspective with regard to actual time, let us summarize the contrast between actual time and time as a possibility in God's ideas.

As noted in step (A), God before actualization of a best possible world, has in His mind an infinite number of possible worlds with their possible laws. This actual world, as it



exists in God's mind as a possibility, has its temporal and spatial relations. When the best possible world is actualized, so are time and space as they are in the ideas of God as possibilities. When time and space are actualized along with the world, one then has an actual world with its actual time and actual space.

Now, let us place the above discussion of actual times and actual spaces in a different perspective. The focus is that of viewing actual times and actual places from the perspective of this actually existing world, instead of as possibilities within God's mind. Given this, actual time can be thought of as relative, sensible and apparent. Actual time expresses the non-contemporaneous relations (that is, the form of order) among actually existing sensible things, which relations are visible to sight. Relative sensible, apparent time is, in essence, a mathematical measure based upon abstraction from actually existing things. These observations, to be later textually supported, lead into a consideration of the mathematical side of time, and in particular, of (4) mathematical time.

The distinction of mathematical time cannot be textually supported in Leibniz's writings, in the manner of being able to point to a specific passage wherein this distinction occurs. Yet, it is my opinion that it is useful, given the factor of its expressing the mathematical side of time.

Let us begin to unravel the mathematical aspect of time through investigation into Leibniz's differentiation between time and duration. To this end, a review of the text involving

his account of the origin of the mind's idea of duration, seems appropriate. According to Leibniz:

"§16. Ph. It is not motion, but a constant succession of ideas which gives us the idea of duration.

Th. [A succession of perceptions awakes in us the idea of duration, but it does not make it. Our perceptions never have a succession sufficiently constant and regular to correspond to that of time, which is a continuum uniform and simple, like a straight line. Changing perceptions furnish us the occasion for thinking of time, and we measure it by uniform changes. But were there nothing uniform in nature, time could not be determined, as space likewise could not be determined if there were no fixed or immovable body. So that knowing the rules of different motions, we can always refer them to the uniform intelligible motions, and see beforehand by this means what will happen through the different motions taken together. And in this sense time is the measure of motion, i.e., uniform motion is the measure of non-uniform motion.]"<sup>75</sup>

---

<sup>75</sup>"§16. Ph. Ce n'est pas le mouvement, mais une suite constante d'idées qui nous donne l'idée de la durée. Th. [Une suite de perceptions réveille en nous l'idée de la durée, mais elle ne la fait point. Nos perceptions n'ont jamais une suite assez constante et régulière pour répondre à celle du temps qui est un continu uniforme et simple, comme une ligne droite. Le changement des perceptions nous donne occasion de penser au temps, et on le mesure par des changemens uniformes: mais quand il n'y auroit rien d'uniforme dans la nature, le temps ne laisseroit pas d'estre déterminé, comme le lieu ne laisseroit pas d'estre déterminé aussi quand il n'y auroit aucun corps fixe ou immobile. C'est que connoissant les règles des mouvemens difformes, on peut toujours les rapporter à des mouvemens uniformes intelligibles et prévoir par ce moyen ce qui arrivera par mouvemens difformes, on peut toujours les rapporter à des mouvemens uniformes intelligibles et prévoir par ce moyen ce qui arrivera par des différens mouvemens joints ensemble. Et dans ce sens le temps est la mesure du mouvement, c'est à dire le mouvement uniforme est la mesure du mouvement difforme.]" Ibid., V, pp. 138-39.

Number sixteen refers to the paragraph number in the New Essays Concerning Human Understanding.

The New Essays Concerning Human Understanding is composed in dialogue form. "Ph." and "Th." refer to Philalethes and Theophilus. Philalethes and Theophilus are two friends who converse together. Philalethes states the position of John Locke, whereas Theophilus (who is Leibniz) gives his views on the position.

From the quotation, it is to be noted that the constant train of ideas within our minds furnishes us with the idea of duration. Motion does not furnish us with the idea of duration. The constant train of ideas furnishes us with the idea of duration but it (the constant train of ideas) does not make it (the idea of duration). Our constant train of ideas is never sufficiently constant and regular to correspond to that of time. Time is a uniform and simple continuum like a straight line. The change of ideas "gives us occasion to think of time, and it is measured by uniform changes." If there should be nothing uniform in nature, time would not cease to be determined.

Since the problem of the relationship between time and duration is being confronted, a few remarks by way of review seem necessary. It should be remembered that, according to Leibniz, the origin of men's notion of space is external--that is, men observed and considered things around them and from this they arrived at a notion of space. Leibniz did not say that men observed and considered the things around them, and from this formed a notion of time. Rather, he talks of the origin of men's idea of duration. Since the constant train of ideas in our mind furnishes us with the idea of duration, it seems possible to say that men's notion of duration is the result of internal observation. The change of ideas in our mind does, though, give us occasion to think of time.

From the text now under consideration, and in view of the remarks just made, at least two questions present themselves.

The questions are:

- (1) What is the relationship between motion and duration?
- (2) What is the relationship between duration and time?

To facilitate an answer to the questions, an examination of some related texts seems appropriate. The relevant texts are:

61. I shall not enlarge here upon my opinion explained elsewhere, that there are no created substances wholly destitute of matter. For I hold with the ancients, and according to reason, that angels or intelligences, and souls separated from a gross body, have always subtle bodies, though they themselves be incorporeal. The vulgar philosopher easily admits of all sorts of fictions: mine is more strict.<sup>76</sup>

62. I don't say that matter and space are the same thing. I only say, there is no space, where there is no matter; and that space in itself is not an absolute reality. Space and matter differ, as time and motion. However, these things, though different, are inseparable.<sup>77</sup>

63. But yet it does not at all follow, that matter is eternal and necessary; unless we suppose space to be eternal and necessary: a supposition ill-grounded in all respects.<sup>78</sup>

<sup>76</sup>61. Je ne veux point m'arrester icy sur mon sentiment expliqué ailleurs, qui porte qu'il n'y a point de substances créées entièrement destituées de matiere. Car je tiens avec les Anciens et avec la raison, que les Anges ou les Intelligences, et les Ames séparées du corps grossier, ont toujours des corps Subtils, quoyqu'elles mêmes soyent incorporelles. La Philosophie vulgaire admet aisement toute sorte de fictions; la mienne est plus severe." Ibid., VII, p. 406.

<sup>77</sup>62. Je ne dis point que la matiere et l'espace est la meme chose; je dis seulement qu'il n'y a point d'espace, où il n'y a point de matiere; et que l'espace en luy même n'est point une realité absolue. L'espace et la matiere different comme le temps et le mouvement. Cependant ces choses, quoyque differentes, se trouvent inseparables." Ibid., VII, p. 406.

<sup>78</sup>63. Mais il ne s'ensuit nullement que la matiere soit éternelle et necessaire, si non en supposant que l'espace est éternel et necessaire: supposition mal fondée en toutes manieres." Ibid.

There is, according to Leibniz, no created substance wholly destitute of matter. Leibniz is not claiming that matter and space are the same thing. Leibniz is claiming that there is no space, where there is no matter. Space in itself is not an absolute reality. Space and matter differ, as time and motion differ. Given the fact that space and matter differ, they are however, inseparable. Given the fact that time and motion differ, they are however, inseparable. But, what does it mean to say that time and motion are inseparable? How is one to view the inseparability of time and motion? Perhaps the following short passage will suggest an answer.

Time is the order of non-contemporaneous things.  
It is thus the universal order of change in which  
we ignore the specific kind of changes that have  
occured.<sup>79</sup>

Perhaps by motion, it may be possible to interpret Leibniz as meaning change, and more specifically the universal order of change in which the particular kind of change is ignored. Since time is the order of non-contemporaneous things, I take Leibniz to mean that time concerns things external to the mind, as does space. Still though, how is time related to things external to the mind, to things actually existing? To shed some light upon this problem, let us examine three texts concerning extension, duration, and number, namely:

...Extension never appears to us other than as a plurality of things whose togetherness is continuous, and we find nothing more presupposed in it than

---

<sup>79</sup>C. I. Gerhardt, ed., Mathematische Schriften, VII, pp. 17-28 quoted in Philip Wiener, ed., Leibniz Selections, p. 202.

just this fact. Also the connection of these things is not a necessary one; for we can take away something and substitute something else for it without this making much difference. If we distinguish extension from extended things, then it is something abstract like duration or like number considered detached from things, in which the connection of the parts is just as necessary as with extension. So in the trinity three intelligible unities are held together through an eternal bond, although the connection of three things is perhaps not a necessary one. If we think of removing these determined things, then others always remain behind and number never lacks objects that can be counted; also there is just as little emptiness among them as there is in space or time or other orders of relationship - if we do not assume the universe annihilated so that only pure possibility remains. So that is what extension, duration, and number are without things, if we also regard their common substance as a kind of Platonic idea. Extension is furthermore a relative concept, for it is related to a determined nature whose spread it represents; duration is related to a continually persisting subject. Extension then has the peculiarity that different extended things are found successively in one and the same place, that is, they can enter into the same relation in the order of coexistence, whereas time is peculiar in that several elements can exist together at the same instant.<sup>80</sup>

---

80 "Sed ut ad rem redeam, numquam reperiemus Extensionem sine rebus pluribus quarum continua sit coexistentia, neque aliud quidprehendemus in ea quam hoc ipsum quod tales res intelliguntur. Nexus quoque earum necessarius non est, possunt enim aliquae rerum illarum tolli, nec refert quod aliae sunt substituendae. Extensio autem si ab extensis distinguas, abstractum aliquid est, ut duratio vel ut numerus sejunctus a rebus, in quo connexio partum eodem modo necessaria est ut in extensione. Sic in ternario tres unitates intelligibiles aeterno vinculo colligantur, etsi trium rerum propositarum connexio forte necessaria non sit; quibusdam tamen dentis aliae supersunt, et numquam desunt res numeericis, nec magis in illis vacuum est quam in loco aut in tempore aliusque ordinibus, nisi universum destructum ponamus ut solae supersint possibilitates. Id enim sunt extensio, duratio, numeri sine rebus, etsi vulgo ad instar idearum Platoniarum ut substantiae concipiuntur. Extensio etiam relativa est ad aliquam naturam cujus sit diffusio, ut duratio ad rem quae persistit. Illud interim peculiare est Extensioni, quod uni eidemque loco diversa extensa successiva quadrant, id est in aliorum situm in ordine coexistentiarum succedunt; sed tempori peculiare est, quod plura sunt in tempore eodem simul." Gerhardt, Philosophische Schriften, II, p. 234.

Extension is the quantity of space. It is false to confound extension, as is commonly done, with extended things, and to view it as substance. If the quantity of space is continuously and uniformly diminished, then it becomes a point which has zero magnitude.<sup>81</sup>

Duration is the quantity of time. If the quantity of time is continuously and uniformly diminished, the time passes into an instant which has zero magnitude.<sup>82</sup>

It seems possible to briefly summarize the notable points in the above texts, accordingly:

### Space

- (1) Given the fact that space and matter differ, they are, however, inseparable.
- (2) Extension is a relative concept, which is related to a determined nature, whose spread it represents.
- (3) If extension is distinguished from extended things, then it is something abstract in which the connection of parts is necessary.
- (4) Extension is the quantity of space.

### Time

- (1) Given the fact that time and motion differ, they are however, inseparable.
- (2) Time is the universal order of change, in which the specific kind of changes occurring are ignored.
- (3) Time is measured by uniform changes.
- (4) Time is a uniform and simple continuum, like a

---

<sup>81</sup>C. I. Gerhardt, ed., Mathematische Schriften, VII, pp. 17-28 quoted in Philip Wiener, ed., Leibniz Selections, p. 202.

<sup>82</sup>Ibid.

straight line.

- (5) Duration is the quantity of time.
- (6) Motion does not furnish us with the idea of duration, rather the constant train of ideas furnishes us with the idea of duration.
- (7) Our constant train of ideas is never sufficiently constant and regular to correspond to that of time.
- (8) If duration is distinguished from things, then it is something abstract in which the connection of the parts is necessary.
- (9) Duration is related to a continually persisting subject.

#### Number

- (1) If number is distinguished from extended things, then it is something abstract in which the connection of the parts is just as necessary as with extension.
- (2) Extension, duration, and number are without things, if we do assume the universe annihilated so that only pure possibility remains.

As previously stated, the presently listed points will facilitate in answering the question as to 'how time is related to things external to the mind, to things actually existing,' as well as to the earlier questions, namely, (1) 'What is the relationship between motion and duration?' and (2) 'What is the relationship between duration and time?'. These questions exist within the task of attempting to account for the related-



ness of mathematical time (of the mathematical aspect of time) and of actual time (of the relative, sensible, apparent aspect of time). And this relatedness expresses what is, in my opinion, Leibniz's conception of time as the idealization of the existing relations among things. So, let us proceed.

What about the distinction between actual time and mathematical time? Is one able to draw it with such exactitude that both actual-ideal time and mathematical time are clear in their own right? The answer seems to be, no. It is true that the texts examined seem to support the distinctions. Yet, there appears to be a fundamental problem with regard to the distinction, in view of the texts regarding the differentiation and relatedness of time and duration. The difficulty arises with the attempt at conceiving of actual time without mention of measureability. That is, it seems to me that one cannot talk successfully about time without consideration of measureability, except perhaps as an a priori category of the mind. However, Leibniz is not talking of time as an a priori category of the mind. He seems to be somehow talking about time in terms of both motion and universal-uniform change which is bound to the relations among things. The problem becomes one of attempting to relate time and duration to universal uniform change and motion. Leibniz says that (i) the constant train of ideas furnishes us with the notion of duration and (ii) duration is a quantity of time. Let us interpret Leibniz as suggesting that the origin of our idea of duration is internal whereas its "applicability" is external. With this

move, we are able to relate time and duration to uniform change and motion.

Actual time refers to things (both material and immaterial) and is ideal (that is, it is an idealization of the existing relations among things). It is relative (not absolute) and sensible (given its reference to the phenomena). The constant train of ideas furnishes us with the idea of duration. Duration is a quantity of time (a mathematical measure of time). Time and motion differ, yet they are inseparable. Time, as the universal order of change (or motion) in which the specific kind of changes (or motions) occurring are ignored, is measured by uniform changes. It is a uniform and simple continuum. But our ideas are not capable of giving us such a measure of time. Yet, if one forms determined units of duration through abstraction from phenomena wherein the connection of parts is necessary, one can get a mathematical continuum (or that which is both continuous and selfsame wherein no distinction of content can be made except through reference to something else). Duration is related to a persisting subject but it is also abstracted from a persisting subject (like extension from extended things). Duration distinguished from the persisting subject and considered quantitatively, could be placed within a continuum, hence time. This step suggests the relatedness of actual time and mathematical time. That is, actual time points out the relationship and concern with phenomena (the relative, sensible, apparent aspect of time) whereas mathematical time is concerned with duration and a continuum (the mathematical

aspect of time). With this, it seems to me that the distinction between actual time and mathematical time merges into relative, sensible, apparent, mathematical time. This is to say that time, being tied to the relations among things, is a mathematical measure based upon abstraction from things. And, this expresses, in my opinion, what Leibniz means by saying that time is an idealization of the existing relations among things.

The remaining conception of time to yet be considered is the (5) mathematical infinite and the true infinite.<sup>83</sup> Its value of discussion, at this point in the paper, seems to lie in the factor of its giving a backward look at the problems regarding time just now considered. Since this is true, a summary of the yet textually unsupported findings seems appropriate before proceeding with a review of the texts.

Duration abstracted from things (from the persisting subject) is concerned with a continuum. Given this, one can continually add discrete units of duration with a determined ratio of increase, ad infinitum. According to Leibniz, the true infinite (eternity) viewed from the side of "time" is not the mere addition of units, of times. It (the true infinite viewed as eternity) is the ground of the mathematical time continuum, yet one comes to it secondly - that is, one is first acquainted with the time continuum and later with the true infinite, in the meaning of eternity.

---

<sup>83</sup>Cf. supra, pp. 37 and 51.

Now, let us examine the following five passages, in hopes of obtaining a notion of the true infinite in regard to space and "time," namely:

§1. Ph. One of the most important notions is that of the finite and the infinite, which are regarded as modes of quantity.

Th. [Properly speaking, it is true that there is an infinite number of things, i.e., that there are always more of them than can be assigned. But there is no infinite number, neither line nor other infinite quantity, if these are understood as veritable wholes, as it is easy to prove. The schools have meant or have been obliged to say that, in admitting a syncategorematic infinite,<sup>1</sup> as they call it, and not a categorematic infinite. The true infinite exists, strictly speaking, only in the absolute, which is anterior to all composition, and is not formed by the additions of parts.<sup>2</sup>]<sup>84</sup>

§3. Ph. We have believed that since the power of the mind to expand without limit its idea of space by new additions is always the same, it is thence that the idea of an infinite space is derived.

Th. [It is well to add that this is because the same ratio is seen always to hold good. Let us take a straight line and prolong it until it is double the length of the first. Now it is clear that the second line, being perfectly similar to the first, may be itself doubled in order to have a third, which is still similar to the preceding; and the same ratio holding good always, it is never possible to stop the process; thus the line may be prolonged to infinity, so that the consideration of the infinite arises from that of similarity or from the same ratio, and its origin is the same with that of universal and necessary truths. This shows us how what gives completion

---

<sup>84</sup>§1. Ph. Une notion des plus importantes est celle du Fini et de l'Infini, qui sont regardées comme des Modes de la Quantité.

TH. [A proprement parler, il est vray qu'il y a une infinité de choses, c'est à dire qu'il y en a toujours plus qu'on n'en puisse assigner. Mais il n'y a point de nombre infini ny de ligne ou autre quantité infinie, si on les prend pour des veritables Touts, comme il est aisé de demonstrier. Les écoles ont voulu ou du dire cela, en admettant un infini syncategorematicque, comme elles parlent, et non pas l'infini categorematicque. Le vray infini à la rigueur n'est que dans l'absolu, qui est antérieur à toute composition, et n'est point formé par l'addition des parties.] "Gerhardt, Philosophische Schriften, V, p. 144.

to the conception of this idea is found in ourselves, and cannot come from the experience of our senses, just as necessary truths cannot be proved by induction nor by the senses. The idea of the absolute is in us internally, like that of being; these absolutes are nothing else than the attributes of God, and it may be said that they are not less the source of ideas, because God is himself the principle of beings. The idea of the absolute in relation to space, is only that of the immensity of God, and so of the others. But you deceive yourself in wishing to imagine an absolute space which is an infinite whole composed of parts; there is none such, it is a notion which implies a contradiction, and these infinite wholes, and their opposed infinitesimals, are used only in the calculations of geometers, just like the imaginary roots of algebra.]<sup>85</sup>

---

<sup>85</sup> 5. 3. PH. Nous avons crû que la puissance, qu'a l'esprit d'étendre sans fin son idée de l'espace par des nouvelles additions, estant tousjours la même, c'est de là qu'il tire l'idée d'une espace infini. TH. [Il est bon d'ajouter que c'est parcequ'on voit que la même raison subsiste tousjours. Prenons une ligne droite et prolongeons la, ensorte qu'elle soit double de la première. Or il est clair, que la seconde, estant parfaitement semblable à la première, peuestre doublée de meme, pour avoir la troisième qui est encore semblable aux precedentes; et la même raison ayant tousjours lieu, il n'est jamais possible qu'on soit arrêté; ainsi la ligne peut estre prolongée a l'infini, de sorte que la considération de l'infini vient de celle de la similitude ou de la même raison, et son origine est la meme avec celle des verités universelles et necessaires. Cela fait voir comment ce qui donne de l'accomplissement à la conception de cette idée, se trouve en nous mêmes et ne sauroit venir des experiences des sens, tout comme les verités necessaires ne sauroient estre prouvees par l'induction ny par les sens. L'idée de l'absolu est en nous interieurement comme celle de l'Estre: ces absolus ne sont autre chose que les attributs de Dieu, et on peut dire qu'ils ne sont pas moins la source des idées, que Dieu est luy même le principe des Estres. L'idée de l'absolu par rapport à l'espace n'est autre que celle de l'immensité de Dieu, et ainsi des autres. Mais on se trompe en voulant s'imaginer un espace absolu qui soit un tout infini composé de parties, il n'y a rien de tel, c'est une notion qui implique contradiction, et ces tous infinis, et leurs opposés infiniment petits, ne sont de mist que dans le calcul des Geometres, tout comme les racines imaginaires de l'Algèbre.]  
 Ibid., V, pp. 144-45.

§ 27. Ph. In fact the ideas of time and eternity come from the same source, for we can in our thought add certain lengths of duration to one another as often as we please.

Th. [But in order to draw from them the notion of eternity, it is necessary to think besides that the same reason always exists for going farther. It is this rational consideration which achieves the notion of the infinite or the indefinite in possible progress. Thus the senses alone cannot suffice to cause the formation of these notions. And ultimately it may be said that the idea of the absolute is anterior in the nature of things to that of the limits which are added, but we notice the former only as we commence with what is limited and strikes our senses.]<sup>86</sup>

§ 16. Ph. For the same reason we have no positive idea of an infinite duration or of eternity, any more than of immensity.

Th. [I believe we have a positive idea of both, and this idea is a true one, provided it is not conceived as an infinite whole, but as an absolute or attribute without limits which exists in reference to eternity, in the necessity of the existence of God, without depending upon parts and without the notions being formed by an addition of time. We see furthermore in that way, as I have said already, that the origin of the notion of the infinite comes from the same source as that of necessary truths.]<sup>87</sup>

---

<sup>86</sup> § 27. PH. En effect l'idée du temps et celle de l'éternité viennent d'une même source, car nous pouvons ajouter dans nostre esprit certaines longueurs de durée les unes aux autres aussi souvent qu'il nous plait. TH. [Mais pour en tirer la notion de l'éternité, il faut concevoir de plus, que la même raison subsiste toujours pour aller plus loin. C'est cette considération des raisons qui achève la notion de l'infini ou de l'indefini dans les progrès possible. Ainsi les sens seuls ne sauroient suffire à faire former ces notions. Et dans le fonds on peut dire, que l'idée de l'absolu est antérieure dans la nature des choses à celle des bornes qu'on ajoute, mais nous ne remarquons la première qu'en commençant par ce qui est borné et qui frappe nos sens.] "Ibid., pp. 140-41.

<sup>87</sup> § 16. PH. Par la même raison nous n'avons donc point d'idée positive d'une durée infinie ou de l'éternité, non plus que de l'immensité. TH. [Je croisi que nous avons l'idée positive de l'une et de l'autre et cette idée sera vraie, pourveu qu'on n'y conçoive point comme un tout infini, mais comme un absolu ou attribut sans bornes qui se trouve à l'égard de l'Eternité, dans la nécessité de l'existence de Dieu, sans y dépendre des parties et sans qu'on en forme la notion par une additon de temps. On voit encor par là, comme j ay dit déjà, que l'origine de la notion de l'infini vient de la même source que celle des veries necessaires.] "Ibid., V, p. 146.

So, according to Leibniz, infinity, in its original intention is attributed to space, duration and number. It is true, properly speaking, that an infinity of things exists. An infinity of things exists in the sense that there are always more things existing than one can assign a number to. There does not exist any infinite number nor infinite line nor an other infinite quantity, if we take the infinite number as a genuine whole or the infinite line as a genuine whole or the infinite quantity as a genuine whole. The true infinite, strictly speaking is only the Absolute, which is anterior to all composition and is not formed of parts. We form the idea of infinity in the example of a straight line by prolonging it (the straight line) ad infinitum through use of the same ratio of increase. The idea of infinity in the example of the straight line is found in us and does not arise from sense experience. The idea of the true infinite (the Absolute) is in us internally, like that of being. The idea of infinity (the absolute is nothing but the attribute of God. The idea of the absolute is no less the source of ideas than God is himself the principle of beings. The idea of the absolute in relation to space is no other than that of the immensity of God. We deceive ourselves in wishing to imagine an absolute space, which would be an infinite composed of parts. The idea of the absolute is anterior in the nature of things to that of the limits which are added. But we do not notice the absolute (the true infinite) except in beginning with what is limited and 'which strikes our senses.' We have no positive idea of infinity nor of infinite duration -

that is, the idea of indefinite progress with regard to the addition of parts and determinate ratio of increase. We have a positive idea of infinity or of eternity if we conceive of eternity as grounded in the necessity of God and as an attribute of God and if we conceive of eternity without depending upon parts and without forming the notion by an addition of times.

Now, it ought to be recalled that time and duration was previously discussed in terms of measurability. It was noted that duration is the quantity of time, and time (which is measured by uniform changes) is a uniform and simple continuum, like a straight line. The idea of infinite time, mathematically speaking, could be formed in the example of a straight line (a uniform and simple continuum) by prolonging it ad infinitum through use of the same ratio of increase with regard to a selected length of duration. Here infinite time depends upon the infinite addition of parts, of times. But how is it, that the idea of true infinite differs from this "mathematical" infinite? The true infinite, as regards "time," is the idea of eternity. One conceives of eternity without dependency upon parts and without forming the notion by an addition of times.



## CHAPTER FOUR

### CONCERNING THE QUESTION AS TO WHAT MOMENT OF TIME THE WORLD WAS CREATED

This chapter will investigate further the relational conception of time. The problem undertaken here is that of attempting to ascertain why 'it is not meaningful, on Leibniz's view, to raise the question as to what moment of time the world was created.'

The procedure is the following. First of all, the presuppositions of the question, as to 'what moment of time the world was created,' are listed. This is followed by additional textual examination concerning unlimited-limited extension and motion. Next, a summary of Leibniz's position with regard to space, matter, motion and time is presented. The summary incorporates some of the material discussed in the previous two chapters with the texts just examined. In view of the summary, the presuppositions of Leibniz's system, matching those of the question, are listed. Given these presuppositions of Leibniz's position, it will be evident that the question is not a meaningful one. This being said, let us begin our inquiry into the presuppositions of the question.

The presuppositions of the question as to what moment of time the world was created seem to number seven, namely:

- (1) Space exists prior to the creation of the world.
- (2) Space may or may not be occupied by matter.

- (3) The total amount of matter occupying space is not given, that is, there may be a greater or lesser amount of matter.
- (4) The world is in space, is created in space.
- (5) The world is finite.
- (6) If space exists independently of the world, then one can talk of the world moving within space.
- (7) If space is prior to the world and exists independently of the world, then one can inquire as to what time the world was created in space (and one can also inquire as to what time the world was destroyed in space).

In view of these seven listed presuppositions, let us attempt to locate the matching presuppositions of Leibniz's system. To this end, the examination of texts concerning the problem of unlimited-limited extension and unlimited-limited duration seem helpful. The texts are:

73. He frequently confounds, in his objections against me, what God will not do, with what he cannot do. See above, Numb. 9 [and below Numb. 76]. For example; God can do every thing that is possible, but he will do only what is best. And therefore I don't say, as the author here will have it, that God cannot limit the extension of matter; but 'tis likely he will not do it, and that he has thought it better to set no bounds to matter.<sup>88</sup>

---

<sup>88</sup>"73. On confound souvent dans les objections qu'on me fait, ce que Dieu ne veut point, avec ce qu'il ne peut point. Voyés cy dessus num. 9 et plus bas num 76. Par exemple, Dieu peut faire tout ce qui est possible, mais il ne veut faire que le Meilleur. Ainsi je ne dis point, comme on m'impute icy, que Dieu ne peut point donner des bornes à l'etendue de la matiere, mais il y a de l'apparence qu'il ne le veut point, et qu'il a trouvé mieux de ne luy en point donner." Ibid., VII, p. 408.

74. From extension to duration, non valet consequentia. Though the extension of matter were unlimited, yet it would not follow that its duration would be also unlimited; nay, even a parte ante, it would not follow, that it had no beginning. If it is the nature of things in the whole, to grow uniformly in perfection; the universe of creatures must have had a beginning. And therefore, there will be reasons to limit the duration of things, even though there were none to limit their extension. Besides, the world's having a beginning, does not derogate from the infinity of its duration a parte post; but bounds of the universe would derogate from the infinity of its extension. And therefore it is more reasonable to admit a beginning of the world, than to admit any bounds of it; that the character of its infinite author, may be in both respects preserved.<sup>89</sup>

---

Text number 9 is: "9. Mais de que Dieu ne peut choisir que le meilleur, et d'en vouloir inferer que ce qu'il ne choisit point, est impossible; c'est confondre les Termes, la puissance et la volonté, la nécessité metaphysique et la nécessité morale, les essences et les existences. Car ce qui est nécessaire, l'est par son essence, puisque l'opposé implique contradiction; mais le contingent qui existe, doit son existence au principe du meilleur, raison suffisante des choses. Et c'est pour cela que je dis, que les motifs inclinent sans necessiter et qu'il y a une certitude et infallibilité, mais non pas une nécessité absolu dans les choses contingentes. Joignés a cecy, ce qui ce dira plus bas n. 73. n. 76." Ibid., VII, p. 390.

Text number 76 is: "76. On m'objecte encore icy sans fondement, que selon moy tout ce que Dieu peut faire, doit être fait necessairement. Comme si l'on ignoroit que j'ay refuté cela solidement dans la Theodicée, et que j'ay renversé l'opinion de ceux qui soutiennent qu'il n'y a rien de possible, que ce qui arrive effectivement, comme ont fait déjà quelques anciens Philosophes, et entre autres Diodore chez Ciceron. On confond la nécessité morale, qui vient du choix du meilleur, avec la nécessité absolue; on confond la volonté avec la puissance de Dieu. Il peut produire tout possible, ou ce qui n'implique point de contradiction; mais il peut produire le meilleur entre les possibles. Voyes ce que j'ay dit cy dessus num. 9. et num. 74." Ibid., VII, p. 409.

<sup>89</sup>74. De l'étendue a la durée, non valet consequentia. Quand l'étendue de la matiere n'auroit point de bornes, il ne s'ensuit point que sa durée n'en ait pas non plus, pas même en arriere, c'est à dire, qu'elle n'ait point du de commencement. Si la nature des choses dans le total, est de croître uniformement en perfection, l'univers des creatures doit avoir commencé. Ainsi il y aura des raisons pour limiter la durée des choses, quand meme il n'y en auroit point pour en limiter l'étendue. De plus, le commencement du monde ne deroge point

What should be particularly noted within these passages is that, according to Leibniz:

(1) It is unlikely that God will not limit the extension of matter.

(2) God has thought it better to set no bounds to matter.

Yet, why does Leibniz believe this to be the case? Leibniz posits at least two reasons. To explicate these reasons, it is necessary to examine two sets of texts. The first set of texts is the following:

21. There is no possible reason, that can limit the quantity of matter; and therefore such limitation can have no place.<sup>90</sup>

22. And supposing an arbitrary limitation of the quantity of matter, something might always be added to it without derogating from the perfection of those things which do already exist; and consequently something must always be added, in order to act according to the principle of the perfection of the divine operations.<sup>91</sup>

23. And therefore it cannot be said, that the present quantity of matter is the fittest for the present constitution of things. And supposing it were, it would follow that this present constitution of things would not be the fittest absolutely,

---

a l'infinité de la durée à parte post, ou dans la suite; mais les bornes de l'univers dérogeroient à l'infinité de son étendue. Ainsi il est plus raisonnable d'en poser un commencement que d'en admettre des bornes, à fin de conserver dans l'un et dans l'autre le caractère d'un Auteur infini." Ibid., VII, p. 408.

<sup>90</sup>"21. Il n'y a point de raison possible, qui puisse limiter la quantité de la matière. Ainsi cette limitation ne sauroit avoir lieu." Ibid., VII, p. 374.

<sup>91</sup>"22. Et supposé cette limitation arbitraire, on pourroit toujours ajouter quelque chose sans déroger à la perfection des choses qui sont déjà: et par conséquent il faudra toujours y ajouter quelque chose, pour agir suivant le principe de la perfection des opérations divines." Ibid.

if it hinders God from using more matter. It were therefore better to choose another constitution of things, capable of something more.<sup>92</sup>

Now, according to Leibniz, there is no possible reason that can limit the quantity of matter. But, suppose that there is an arbitrary limitation of matter and suppose that the limitation is the fittest for the present constitution of things. Then it is possible that something may be added to the present perfection of things which do exist. Given the fact that some thing may be added to the present constitution of things, it cannot be said, that the present quantity of matter is the fittest for the present constitution of things. If the present limited quantity of matter were the fittest for the present constitution of things, it would not follow that this present constitution of things is the fittest absolutely. If the present constitution of things is not the fittest absolutely, then it hinders God from using more matter. If the present constitution of things hinders God from using more matter, it would be better to choose another constitution of things capable of something more.

The second set of texts consists of but one text, which text is:

9. I had observed, that by lessening the quantity of matter, the quantity of objects, upon which God may exercise his goodness, will be lessen'd.

---

<sup>92</sup>"23. Ainsi on ne sauroit dire que la presente quantité de la matiere est la plus convenable pour leur presente constitution. Et quand même cela seroit, il s'ensuivroit que cette presente constitution des choses ne seroit point la plus convenable absolument, si elle empeche d'employer plus de matiere; il faudroit donc en choisir une autre, capable de quelque chose de plus." Ibid.

The author answers, that instead of matter, there are other things in the void space, on which God may exercise his goodness. Be it so: tho' I don't grant it; for I hold that every created substance is attended with matter. However let it be so: I answer, that more matter was consistent with those same things; and consequently the said objects will still be lessened. The instance of a greater number of men, or animals, is not to the purpose; for they would fill up place, in exclusion of other things.<sup>93</sup>

The main point to be noted therein is that on Leibniz's view, by lessening the quantity of matter, the quantity of objects upon which God may exercise His goodness will be lessened.

Generally speaking, the reasons, as to why Leibniz believes that the extension of matter is unlimited, number two, namely:

- (1) the present constitution of things would not be the fittest absolutely (that is, this would not be the best possible world)
- (2) by lessening the quantity of matter, the quantity of objects upon which God may exercise His goodness, would be lessened.

But absolutely speaking, it appears that the universe could be finite in extension. With this in mind, let us review these passages:

---

<sup>93</sup>"9. J'avois remarqué, qu'en diminuant la quantité de la matiere, on diminue la quantité des objets, où Dieu peut exercer sa bonté. On me répond, qu'au lieu de la matiere, il y a d'autres choses dans le vuide, où il ne laisse pas de l'exercer. Soit. Quoyque je n'en demeure point d'accord, car je tiens que toute substance créée est accompagnée de Matiere. Mais soit, dis-je; je réponds, que plus de matiere étoit compatible avec ces mêmes choses, et par consequent, c'est tousjours diminuer le dit objet. L'instance d'un plus grand nombre d'hommes ou d'animaux ne convient point, car ils oteroiert la place à d'autres choses." Ibid., VII, p. 365.

29. I have demonstrated that space is nothing else but an order of the existence of things, observed as existing together; and therefore the fiction of a material finite universe, moving forward in an infinite empty space, cannot be admitted. It is altogether unreasonable and impracticable. For, besides that there is no real space out of the material universe; such an action would be without any design in it: it would be working without doing anything, agendo nihil agere. There would happen no change, which could be observed by any person whatsoever. These are imaginations of philosophers who have incomplete notions, who make space an absolute reality. Mere mathematicians, who are only taken up with the conceits of imagination, are apt to forge such notions; but they are destroyed by superior reasons.<sup>94</sup>

30. Absolutely speaking, it appears that God can make the material universe finite in extension; but the contrary appears more agreeable to his wisdom.<sup>95</sup>

Absolutely speaking, it appears that God can make the material universe finite in extension. That is, it is possible to frame within the imagination the idea of a finite material universe. Such imagination is destroyed by superior reasons, namely those of God. So, given the fact that the extension of matter is unlimited, it does not follow that the duration of matter

---

<sup>94</sup>"29. J'ay démontré que l'espace n'est autre chose qu'un ordre de l'existence des choses, qui se remarque dans leur simultanéité. Ainsi la Fiction d'un Univers matériel fini, qui se promène tout entier dans un espace vuide infini, ne sauroit être admise. Elle est tout à fait deraisonnable et impraticable. Car outre qu'il n'y a point d'espace réel hors de l'univers matériel, une telle action seroit sans but; ce seroit travailler sans rien faire, agendo nihil agere. Il ne produiroit aucun changement observable par qui que ce soit. Ce sort des imaginations des Philosophes à notions incomplètes, qui se font de l'espace une réalité absolue. Les simples Mathématiciens, qui ne s'occupent que de jeux de l'imagination, sont capables de se forger de telles notions; mais elles sont détruites par des raisons supérieures." Ibid., VII, pp. 395-96.

<sup>95</sup>"30. Absolument parlant, il paroît que Dieu peut faire l'univers matériel fini en extension, mais le contraire paroît plus conforme à sa sagesse." Ibid.

is also unlimited. Given the fact that the extension of matter is unlimited, it does not follow that matter has no beginning. There is a reason to limit the duration of things --that is, if it is the nature of things in the whole to grow uniformly in perfection, the universe of creatures must have had a beginning--even though there are none to limit their extension. The world's having a beginning does not detract from the infinity of its duration. Bounds of the universe would detract from the infinity of its extension.

Since we are attempting to obtain the matching presuppositions, let us immediately proceed onto review of additional texts concerning motion. Following these, a summary of Leibniz's position with regard to space, matter, motion and time will be presented so as to enable us to locate the seven matching presuppositions with comparative ease.

The texts concerning motion are:

52. In order to prove that space, without bodies, is an absolute reality; the author objected, that a finite material universe might move forward in space. I answered, it does not appear reasonable that the material universe should be finite; and, though we should suppose it to be finite; yet 'tis unreasonable it should have motion any otherwise, than as its parts change their situation among themselves; because such a motion would produce no change that could be observed, and would be without design. 'Tis another thing, when its parts change their situation among themselves; for then there is a motion in space; but it consists in the order of relations which are changed. The author replies now, that the reality of motion does not depend upon being observed; and that a ship may go forward, and yet a man, who is in the ship, may not perceive it. I answer, motion does not indeed depend upon being observed; but it does depend upon it being possible to be observed. There is no motion, when there is no change at all. The



contrary opinion is grounded upon the supposition of a real absolute space, which I have demonstratively refuted by the principle of the want of a sufficient reason of things.<sup>96</sup>

31. I don't grant that every finite is movable. According to the hypothesis of my adversaries themselves, a part of space, though finite, is not movable. What is movable must be capable of changing its situation with respect to something else, and to be in a new state discernible from the first: otherwise the change is but a fiction. A movable finite, must therefore be part of another finite, in order that any change may happen which can be observed.<sup>97</sup>

In order to prove that space without bodies is an absolute reality, Samuel Clark noted that a finite material universe might move forward in space. To Leibniz, it does not appear

---

<sup>96</sup>"52. Pour prouver que l'Espace sans les corps est quelque réalité absolu, on m'avoit objecté que l'univers matériel fini se pourroit promener dans l'espace. J'ay répondu, qu'il ne paroît point raisonnable que l'univers matériel soit fini; et quand on le supposeroit, il est deraisonnable qu'il ait de mouvement, autrement qu'en tant que ses parties changent de situation entre elles: parce qu'un tel mouvement ne produiroit aucun changement observable, et seroit sans but. Autre chose est quand ses parties changent de situation entr'elles, car alors on y reconnoist un mouvement dans l'espace, mais consiste dans l'ordre des rapports, qui sont changés. On replique maintenant, que la vérité du mouvement est indépendante de l'observation, et qu'un vaisseau peut avancer sans que celui qui est dedans s'en aperçoive. Je réponds que le mouvement est indépendant de l'observation, mais qu'il n'est point indépendant de l'observabilité. Il n'y a point de mouvement, quand il n'y a point de changement observable. Et meme quand il n'y a point de changement observable, il n'y a point de changement de tout. Le contraire est fondé sur la supposition d'un Espace reel absolu, que j'ay refuté demonstrativement par le principe du besoin d'une raison suffisante des choses." Ibid., VII, pp. 403-04.

<sup>97</sup>"31. Je n'accorde point que tout fini est mobile. Et selon l'hypothese même des adversaires, une partie de l'espace, quoique finie, n'est point mobile. Il faut que ce qui est mobile, puisse changer de situation par rapport à quelque autre chose, et qu'il puisse arriver un état nouveau discernable du premier: autrement le changement est une fiction. Ainsi il faut qu'un fini mobile fasse partie d'un autre, à fin qu'il puisse arriver un changement observable." Ibid., VII, p. 396.

reasonable that the material universe should be finite, even though one would want to suppose it so. It is, according to Leibniz, unreasonable to suppose the material universe has any motion other than the motion of its parts changing their situation among themselves. Not every finite is movable. What is movable must be capable of changing its situation with respect to something, and to be in a new state discernible from the first. A finite material universe moving forward would produce no change that could be observed, and would be without design. Motion does not depend upon being observed but rather it depends upon it being possible to be observed. There is no motion where there is no change that can be observed. And when there is no change that can be observed, there is no change at all.

Let us now summarize the Leibnizian position with regard to space, matter, motion and time so as to be better able to make obvious the presuppositions of the position.

The extension of matter is unlimited. The unlimited extension of matter has a beginning and given the fact that the extension of matter has a beginning, it has an infinite duration. There is no created substance wholly destitute of matter. There is no space where there is no matter. Although space and matter differ, they are inseparable. Extension, being the quantity of space, appears as a plurality of things whose togetherness is continuous. The connection of the plurality of things is not necessary because one can take away something and substitute something else for it without making

much difference. This is to say that different things can enter into the same relation of co-existence. The order of co-existence is, in general, a simple relation of one thing to another or the distance of one thing from another thing. A co-existing thing can change its relation to a number of other co-existing things (fixed existents) which do not change their relation among themselves. If a "newly-come" thing acquires the same relation to the other co-existing thing(s), as the former had, one then says that it has come into the place of the former thing. If the cause of change of situation is within the body, that body is truly in motion. If a body is truly in motion, then the situation of other bodies, with respect to it, will be changed though the cause of that change is not in them. It is unreasonable to suppose that the material universe has any motion other than the motion of its parts changing their situation among themselves. What is movable must be capable of changing its situation with respect to something, and to be in a new state (or position) discernible from the first. A movable finite must be part of another finite, so that any change that may happen may be possibly observed. Those things which have such a relation to these fixed existents, as others had to them before, have now the same place which those others had. Space is that which comprehends all those places.

In view of this summary, let us list the "matching" pre-suppositions of Leibniz's position to those of the question. Thus:

- (1) Space, matter, motion and time are created simultaneously (that is, a possible world is actualized).
- (2) Space and matter are inseparable.
- (3) There is no space where there is no matter.
- (4) Space is an idealization of the existing relations among contemporaneous things.
- (5) The extension of matter is unlimited.
- (6) It is unreasonable to suppose that the material universe has any motion other than that of its parts changing their situation among themselves.
- (7) This is not a meaningful inquiry, given (1) through (6).

## SELECTED BIBLIOGRAPHY

### Texts

- Alexander, H. G., ed. The Leibniz-Clark Correspondence. New York: Manchester University Press, 1970.
- Buchenau, A. and Cassirer, E., eds. G. W. Leibniz Philosophische Werke. 4 vols. Leipzig, 1924.
- Cajori, Florian, trans. Sir Isaac Newton's Mathematical Principles of Natural Philosophy and His System of the World. 2 vols. Berkeley: University of California Press, 1962. [This is a revised translation of that of Andrew Motte in 1729.]
- Erdmann, J., ed. Gottfried Wilhelm Leibniz Opera Philosophica quae exstant latina gallica germanica omnia. Meisenheim: Scientia Aalen, 1959.  
[Faksimiledruck der Ausgabe 1840 durch seitere Textstucke ergantz und mit einem Vorwort versehen von Renate Vollbrecht.]
- Gerhardt, C. I., ed. Die mathematischen Schriften von G. W. Leibniz. 7 vols. Berlin, 1894-63.
- \_\_\_\_\_. Die philosophischen Schriften von G. W. Leibniz. 7 vols. Berlin, 1875-1890.
- Horsley, Samuel, ed. Isaac Newton Opera Quae Exstant Omnia. 5 vols. Stuttgart: Bad Cannstatt, 1964.  
[Faksimile-Neudruck der Ausgabe von Samuel Horsley, London, 1779-1785 in funf Banden.]
- Langley, Alfred, trans. New Essays Concerning Human Understanding. 3rd ed. LaSalle, Illinois: Open Court Publishing Co., 1949.
- Schrecker, Paul and Schrecker, Anne Martin, eds. Monadology and Other Philosophical Essays. The Library of Liberal Arts. Indianapolis: The Bobbs-Merrill Company, Inc., 1965.
- Wiener, Philip, ed. Leibniz Selections. New York: Charles Scribner's Sons, 1951.

## Studies

- Burt, Edwin Arthur. The Metaphysical Foundations of Modern Physical Science. London: Routledge & Kegan Paul LTD, 1950.
- Carr, Herbert Wildon. Leibniz. Boston: Little, Brown and Company, 1929.
- Copleston, S.J., Frederick. A History of Philosophy, Vol. IV: Modern Philosophy: Descartes to Leibniz. Image Books. New York: Doubleday & Co., 1963.
- \_\_\_\_\_. A History of Philosophy. Vol. VI: Modern Philosophy: The French Enlightenment to Kant. Image Books. New York: Doubleday & Co., 1963.
- De Morgan, Augustus. Essays on the Life and Work of Newton. Edited by Philip E. B. Jourdain. Chicago: The Open Court Publishing Company, 1914.
- Frazer, J. T., ed. The Voices of Time. New York: George Braziller, 1966.
- The History of Science Society. Sir Isaac Newton 1727-1927: A Bicentenary Evaluation of His Work. Baltimore: The Williams & Wilkins Company, 1928.
- Lovejoy, Arthur O. The Great Chain of Being. Harper Torchbooks. Harper & Row: New York, 1965.
- Martin, Gottfried. Leibniz Logic and Metaphysics. New York: Barnes and Noble Inc., 1960.
- Paton, H. J. Kant's Metaphysic of Experience. Vol. I. New York: Humanities Press, 1965.
- Rescher, Nicholas. The Philosophy of Leibniz. New Jersey: Prentice-Hall, 1967.
- Russell, Bertrand. The Philosophy of Leibniz. London: G. Allen & Unwin Ltd., 1937.
- Saw, Ruth Lydia. Leibniz. Penguin Books. Maryland: Doubleday & Co., 1954.
- Smith, Norman Kemp. A Commentary to Kant's 'Critique of Pure Reason.' New York: Humanities Press, 1963.

## Papers

- Ballard, Kaith Emerson. "Leibniz's Theory of Space and Time." J. hist. Ideas, XXIV (1960), 49-65.

- Mackinnon, S.J., Edward. "Time and Contemporary Physics." Int. philos. Quart., II (September, 1962), 428-57.
- Shapere, Dudley. "Isaac Newton." Encyclopedia of Philosophy, XV. New York: The Macmillan Co. & The Free Press, 1967.
- Schrecker, Paul. "Leibniz and the Timaeus." Rev. Meta., IV (June, 1951), 495-505.

The thesis submitted by Ina Van Loo has been read and approved by members of the Department of Philosophy.

The final copies have been examined by the director of the thesis, and the signature which appears below verifies the fact that any necessary changes have been incorporated, and that the thesis is now given final approval with reference to content and form.

The thesis is therefore accepted in partial fulfillment of the requirements for the degree of Master of Arts.

May 7, 71  
(date)

Guthrie L. Krumholz, Jr.  
(signature)